



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

WASHINGTON, D.C. 20460

OFFICE OF  
PREVENTION, PESTICIDES  
AND TOXIC SUBSTANCES

Date: Feb 28, 2006

**MEMORANDUM**

**SUBJECT:** 1,2,4-Triazole, Triazole Alanine, Triazole Acetic Acid: Drinking Water Assessment in Support of Reregistration and Registration Actions for Triazole-derivative Fungicide Compounds.

Risk Assessment Type: Single Chemical Aggregate

PC Code: 600074 – 1,2,4-Triazole

600011 – Triazole Alanine

600082 – Triazole Acetic Acid

DP Number: D320682

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A Tier II drinking water assessment was performed for 1,2,4-triazole and triazole conjugates, i.e. triazole alanine and triazole acetic acid. 1,2,4-Triazole and its conjugates are common metabolites to the class of compounds known as the conazoles. These compounds all have a triazole ring with nitrogen atoms at the 1, 2, and 4 positions.



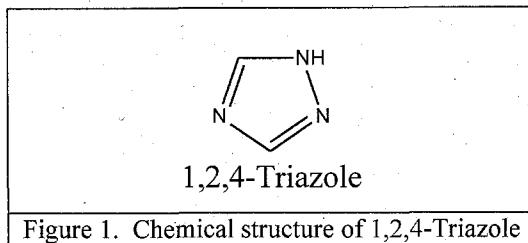


Figure 1. Chemical structure of 1,2,4-Triazole

The assessment is very conservative, based on the Tier II modeling for 1,2,4-triazole and based on molecular conversion from triazole to triazole conjugates. In the absence of fate studies for triazole conjugates and in the light of 1,2,4-triazole interconversion to triazole conjugates, the concentrations of triazole alanine and triazole acetic acid were derived assuming 100% conversion from 1,2,4-triazole to conjugates and using molecular weight conversion from 1,2,4-triazole to triazole conjugate.

The highest estimated surface water concentrations were obtained for ground applications of myclobutanil to PA golf course turf at the maximum annual application rate of 10.38 lb a.i./acre (six applications of 1.73 lb a.i./acre with fourteen day intervals). The highest estimated concentrations from food uses were derived for ground application of myclobutanil to NC apples at the maximum annual application rate of 2.0 lb a.i./acre (two applications of 1.0 lb a.i./acre with seven day interval). The predicted drinking water concentrations of 1,2,4-triazole, triazole acetic acid, and triazole alanine from surface water sources are presented in Table 1.

Table 1. Estimated Drinking Water Concentrations for 1,2,4-Triazole, Triazole Acetic Acid, and Triazole Alanine.

Scenario	Annual Fungicide Application Rate (lb a.i./acre)	Estimated Drinking Water Concentrations (ppb)		
		1 in 10 year annual peak	1 in 10 year annual mean	36 year annual mean
PA golf course turf	1.73 x 6 = 10.38	1,2,4-Triazole		
		41.0	11.0	2.69
		Triazole Acetic Acid		
		75.4	20.2	4.95
		Triazole Alanine		
		92.7	24.9	6.08
NC apples	1.0 x 2 = 2.0	1,2,4-Triazole		
		16.7	3.21	1.34
		Triazole Acetic Acid		
		30.7	5.91	2.47
		Triazole Alanine		
		37.7	7.27	3.03

Although, preliminary PDP monitoring data showed no detections of 1,2,4-triazole in any of the 271 water samples analyzed, the PDP monitoring was not design to target conazole fungicide high use areas. Hence the data are not representative of worst case drinking water concentrations and the data are not recommended to be used in the risk assessment.

SCI-GROW modeling predicted a ground water concentration for 1,2,4-triazole from

non-agricultural uses (i.e., myclobutanil applied six times at 1.73 lb a.i./acre) at 1.1 µg/L and from agricultural uses (myclobutanile applied twice at 1.0 lb a.i./acre) at 0.2 µg/L in drinking water from shallow ground water sources. All concentrations were estimated with the same assumption as for surface water modeling. These concentrations may be considered as both the peak and annual average upper bound exposures.

The SCI-GROW predicted concentrations are lower than those from a small scale prospective groundwater monitoring study conducted in New Jersey for parent triadimefon (1997). In that study, the average maximum concentration (663-day mean) of 1,2,4-triazole in pore water at a depth of 9 ft was 16.7 µg/L.

The environmental fate database for 1,2,4-triazole was generally sufficient to conduct drinking water assessment. The database has a key data gap with regard to there being no aerobic and anaerobic aquatic metabolism study in the water/sediment system to characterize dissipation of 1,2,4-triazole in natural water. Instead the registrant submitted a waiver for each of the studies. These waiver requests are currently under review. No separate laboratory and fate studies were submitted for triazole conjugates (triazole alanine and triazole acetic acid). Hence the Tier II drinking water modeling could not be performed for triazole alanine and triazole acetic acid.

All three metabolites may occur in the environment. The degree of formation of these metabolites in different environmental compartments is highly dependent on the properties of the various parent triazole pesticides. Based on the registrant submitted laboratory and field studies 1,2,4-triazole appears to be persistent (laboratory half-lives ( $t_{1/2}$ )  $\geq$  22 days, field  $t_{1/2} \geq$  231 days) and very mobile in the soil ( $K_{ads}$  ranged from 0.234 to 0.748). 1,2,4-Triazole main routes of dissipation are aerobic soil metabolism, leaching into the ground water, and runoff in to the surface water. For this assessment it was assumed that both conjugates of 1,2,4-triazole, triazole alanine and triazole acetic acid, have similar fate characteristic to 1,2,4-triazole.

This assessment may require revision if new uses are for sites not already addressed by the current list of registered or proposed uses or if the formation of the metabolites exceeds the estimates used herein.

## **INTRODUCTION**

### **Mode of Action**

Following application of a triazole-derivative fungicide, via chemical and/or biological transformation the triazole ring appears to be released into the environment from the parent compound. The degree of formation of any given form of the triazole ring (Table 1, Appendix I) is highly dependent on the nature and properties of the parent compound.

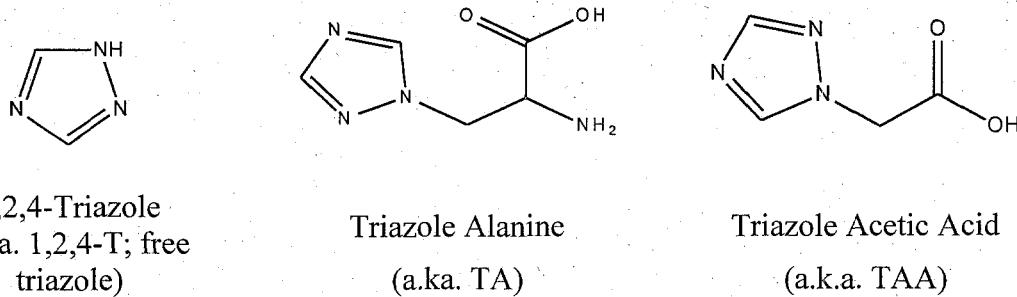


Figure 2. Chemical structures for 1,2,4-triazole, triazole alanine, and triazole acetic acid

The parent triazole fungicides act by inhibiting sterol synthesis, particularly by preventing the 14-demethylation of the sterols. The sterols, which are similar to cholesterol in mammals, are important for fungi membrane structure and function. The mode(s) of action for mammalian toxicity associated with 1,2,4-triazole and the triazole conjugates is currently unknown.

### Proposed Uses

There are 13 registered triazole-derivative fungicides with 53 food uses and 11 non-food uses (i.e., ornamental plants, turf, etc.). Additionally, the Agency has been petitioned to establish registrations for 14 triazole-derivative fungicides with 69 food uses and 4 non-food uses. This drinking water assessment addresses all registered and requested uses as of September 1, 2005. These uses are summarized in Table 2.

Table 2. Summary of Triazole-derivative Fungicides and Uses Addressed in these Risk Assessments.

Sorted by Active Ingredient		Sorted by Use Site	
Active Ingredient	Use Site	Use Site	Active Ingredient
Bitertanol	Banana	Almond	Fenbuconazole
Bromuconazole	Banana		Myclobutanil
	Ornamentals		Propiconazole
Cyproconazole	Turf		Difenoconazole
	Coffee	Apple	Myclobutanil
	Soybean		Triadimefon
Difenoconazole	Turf	Asparagus	Myclobutanil
	Apple		Tebuconazole
	Banana		Triadimefon
	Barley		Bitertanol
	Canola	Banana	Bromuconazole
	Grape		Difenoconazole
	Sweet Corn		Epoxiconazole
	Wheat		Fenbuconazole
Epoxiconazole	Banana		Hexaconazole
Fenbuconazole	Almond		Metconazole

Table 2. Summary of Triazole-derivative Fungicides and Uses Addressed in these Risk Assessments.

Sorted by Active Ingredient		Sorted by Use Site	
Active Ingredient	Use Site	Use Site	Active Ingredient
Triadimenol	Banana	Barley	Myclobutanil
	Blueberry		Propiconazole
	Citrus Fruit Group		Tebuconazole
	Cranberry		Tetraconazole
	Grape		Triadimenol
	Ornamentals		Difenconazole
	Peanut		Prothioconazole
	Pecan		Tebuconazole
	Pome Fruit Group		Triticonazole
	Stone Fruit Group	Berry Group	Propiconazole
	Sugarbeet	Blueberry	Fenbuconazole
	Turf	Bulb Vegetable Group	Propiconazole
	Wheat	Caneberry	Tebuconazole
Flusilazole	Soybean		Myclobutanil
Hexaconazole	Banana		Triadimefon
Ipconazole	Cucurbit Vegetable Group	Canola	Difenconazole
	Ornamentals	Carrot	Prothioconazole
	Sweet Corn		Propiconazole
	Turf		Propiconazole
Metconazole	Banana	Cereal Grain Group	Propiconazole
	Soybean		Triadimenol
Myclobutanil	Almond	Citrus Fruit Group	Fenbuconazole
	Artichoke		Propiconazole
	Asparagus	Coffee	Cyproconazole
	Banana		Tebuconazole
	Caneberry		Triadimefon
	Cotton	Corn	Propiconazole
	Cucurbit Vegetable Group		Tebuconazole
	Currant/Gooseberry		Triadimenol
	Grape	Cotton	Myclobutanil
	Hops		Tebuconazole
	Mayhaw		Triadimenol
	Ornamentals	Cranberry	Fenbuconazole
	Peppermint/Spearmint		Propiconazole
	Peppers		Ipconazole
	Pome Fruit Group	Cucurbit Vegetable Group	Myclobutanil
	Snap Bean		Tebuconazole
	Stone Fruit Group	Currant/Gooseberry	Myclobutanil
	Strawberry		Propiconazole
	Sugar Beet	Dry Bean and Pea Group	Prothioconazole
	Tomato		Tebuconazole

Table 2. Summary of Triazole-derivative Fungicides and Uses Addressed in these Risk Assessments.

Sorted by Active Ingredient		Sorted by Use Site	
Active Ingredient	Use Site	Use Site	Active Ingredient
Pacllobutrazol	Turf	Grape	Difenoconazole
	Ornamentals		Fenbuconazole
	Turf		Myclobutanil
	Almond		Tebuconazole
Propiconazole	Banana	Grass Grown for Seed	Triadimefon
	Berry Group		Propiconazole
	Bulb Vegetable Group		Tebuconazole
	Carrot	Hops	Myclobutanil
	Celery		Tebuconazole
	Cereal Grain Group	Lychee	Tebuconazole
	Citrus Fruit Group	Mango	Tebuconazole
	Corn	Mayhaw	Myclobutanil
	Cranberry		Triadimefon
	Currant/Gooseberry	Oats	Tebuconazole
	Grass Grown for Seed	Okra	Tebuconazole
	Ornamentals	Ornamentals	Bromuconazole
	Peanut		Fenbuconazole
	Pecan		Ipconazole
	Pineapple		Myclobutanil
	Pistachio		Pacllobutrazole
	Sorghum		Propiconazole
	Soybean		Tebuconazole
	Stone Fruit Group		Triadimefon
	Strawberry	Peanut	Fenbuconazole
	Sugar Beet		Propiconazole
Prothioconazole	Sugarcane		Prothioconazole
	Turf		Tebuconazole
	Wild Rice		Tetraconazole
	Barley	Pecan	Fenbuconazole
	Canola		Propiconazole
Tebuconazole	Dry Bean and Pea Group	Peppermint/Spearmint	Myclobutanil
	Peanut	Peppers	Myclobutanil
	Rice	Pineapple	Propiconazole
	Soybean		Triadimefon
	Wheat	Pistachio	Propiconazole
	Asparagus		Tebuconazole
	Banana	Pome Fruit Group	Fenbuconazole
	Barley		Myclobutanil
	Bulb Vegetable Group		Tebuconazole
	Coffee		Triadimefon
	Corn	Rice	Prothioconazole
	Cotton	Snap Bean	Myclobutanil

Table 2. Summary of Triazole-derivative Fungicides and Uses Addressed in these Risk Assessments.

Sorted by Active Ingredient		Sorted by Use Site	
Active Ingredient	Use Site	Use Site	Active Ingredient
	Cucurbit Vegetable Group	Sorghum	Propiconazole
	Dry Bean and Pea Group		Triadimenol
	Grape	Soybean	Cyproconazole
	Grass Grown for Seed		Flusilazole
	Hops		Metconazole
	Lychee		Propiconazole
	Mango		Prothioconazole
	Oats		Tebuconazole
	Okra		Tetraconazole
	Ornamentals	Stone Fruit Group	Fenbuconazole
	Peanut		Myclobutanil
	Pistachio		Propiconazole
	Pome Fruit Group		Tebuconazole
	Soybean	Strawberry	Myclobutanil
	Stone Fruit Group		Propiconazole
	Sunflower	Sugar Beet	Myclobutanil
	Tree Nuts Group		Propiconazole
	Turf		Tetraconazole
	Turnip		Fenbuconazole
	Wheat	Sugarcane	Propiconazole
Tetraconazole	Banana		Tebuconazole
	Peanut	Sweet Corn	Difenconazole
	Soybean		Ipconazole
	Sugar Beet	Tomato	Myclobutanil
	Turf		Tebuconazole
Triadimefon	Artichoke	Turf	Bromuconazole
	Asparagus		Cyproconazole
	Caneberry		Fenbuconazole
	Coffee		Ipconazole
	Grape		Myclobutanil
	Mayhaw		Paclobutrazole
	Ornamentals		Propiconazole
	Pineapple		Tebuconazole
	Pome Fruit Group		Tetraconazole
	Turf		Triadimefon
Triadimenol	Banana	Turnip	Triticonazole
	Cereal Grain Group		Tebuconazole
	Corn		Difenconazole
	Cotton		Fenbuconazole
	Sorghum		Prothioconazole
Triticonazole	Barley	Wheat	Tebuconazole
	Turf		Triticonazole

Table 2. Summary of Triazole-derivative Fungicides and Uses Addressed in these Risk Assessments.

Sorted by Active Ingredient		Sorted by Use Site	
Active Ingredient	Use Site	Use Site	Active Ingredient
	Wheat	Wild Rice	Propiconazole

## ENVIRONMENTAL FATE SUMMARY

Based on the registrant submitted laboratory and field studies 1,2,4-triazole appears to be persistent (laboratory  $t_{1/2} \geq 22$  days and field  $t_{1/2} \geq 231$  days) and very mobile in the soil ( $K_{ads}$  ranged from 0.234 to 0.748). 1,2,4-Triazole major routes of dissipation are aerobic soil metabolism, leaching into the ground water, and runoff in to the surface water.

Hydrolysis (MRID 43241219) and aqueous photolysis are not significant routes of triazole dissipation. In sterile aqueous buffer solutions the hydrolysis half-lives ( $t_{1/2}$ ) were 133 days in pH 5, 161 days in pH 7, and 114 days pH 9 (MRID 45284026).

Aerobic soil microbial degradation of 1,2,4-triazole appears to be rather slow at higher application rates and faster at lower application rates. The half-lives ranged from 22 days to 375 days (Table 3). The aerobic soil metabolism degradation products were hydroxytriazole (3-hydroxy-1,2,4-triazole), triazolyl alanine (1,2,4-triazole-1-alanine), and triazolyl acetic acid (max. 18%; MRID 45297203 (Experiment II)),  $CO_2$ , and bound residues. Under anaerobic soil conditions 1,2,4-triazole metabolized slowly with half-life of 84 days to 1,2,4-triazolyl acetic acid (50.3% after 122 days) and other minor byproducts (e.g. 2-amino-3[1,2,4]triazol-1-yl-propionic acid, MRID 45930701).

Table 3. Summary information of 1,2,4-Triazole aerobic soil metabolism study.

Treatment Level	Soil type	Half-life ( $T_{1/2}$ ) in days	Reference
ca. 0.06 ppm	German sandy loam	26.5	MRID 45284032
	German loamy sand	46.7	
	German silt loam	22.2	
50 ppm	Soil 2.2	343	MRID 45297203
	Soil 2.3	375	
1 ppm	Silty loam soil	155	MRID 45284027

1,2,4-Triazole residue may accumulate in crops after triazole application on the cropped soil. Total residues in the wheat plants were the maximum of 61.1-61.3% by 60-90 days after soil treatment with triazole (Experiment III, MRID 45297203). Another laboratory experiment showed that 1,2,4-triazole was almost completely metabolized in 14 days via a bacteria culture, *Nocardia corallina* (MRID 45297203), and triazolyl alanine was the principal metabolite isolated from the cultures.

According to McCall classification (McCall *et al.*, 1980) 1,2,4-triazole has a high mobility potential in mineral soil. Freundlich  $K_{ads}$  values were 0.833 for the silty clay soil, 0.748 for the clay loam soil, 0.234 for the sand soil, 0.722 for the silty clay loam soil, and 0.722 for the sandy loam soil. Corresponding  $K_{oc}$  values were 120 for the silty clay soil, 43 for the clay loam soil, 202 for the sand soil, 104 for the silty clay loam soil, and 89 for the sandy loam soil (MRID 40891501). Column leaching studies confirm that 1,2,4-triazole has leaching potential in different soil types. In one study, two tested soil leachates comprised of 42-46% of the applied radioactivity (MRID 45284030). In another study, it was shown that triazole leached much deeper into the soil than monuron known to be a moderate "leacher" (MRID 43241218).

Two terrestrial field dissipation studies confirmed that 1,2,4-triazole may leach and persist in the soil for months following its application. In one study  $C^{14}$  residues of 1,2,4-triazole dissipated from the top 3" soil layer with a half-life of 231 days and the top of 36" soil layer with the half-life of 381 days after an application to vineyard silt loam soil in PA (MRID 45284025). In the second study after two field applications 1,2,4-triazole onto winter wheat in PA and MS 1,2,4-triazole leached to at least 12 inches soil depth throughout the course of the study (363 - 639 days (MRID 47031420)

For more information on the registrant submitted laboratory and field studies refer to the individual fate study summaries provided in Attachment III of this document.

## **DRINKING WATER ASSESSMENT**

This drinking water assessment was performed based on the assumption that no two conazole fungicides are applied at the same time at the same site and that the formation of 1,2,4-triazole from any applied triazole fungicides does not exceed 30.7 percent (Attachment I, Table 1).

For the surface water modeling the PRZM-EXAM model was used as if 1,2,4-triazole was ground "applied" to the field. For the ground water modeling the SCI-GROW model was used with the same assumptions.

### **A. Surface Water Assessment**

#### **1,2,4-Triazole**

The modeling scenario was based on the following: (1) assuming 30.7% conversion from parent to 1,2,4-triazole and (2) using molecular weight conversion to adjust from parent application rate to 1,2,4-triazole application rate. Based on the laboratory and field studies, triadimefon had the highest conversion percentage (30.7%) to form 1,2,4-triazole among nine triazole forming fungicides (difenconazole, tebuconazole, triadimefon, triadimenol, propiconazole, myclobutanil, prothioconazole, fenbuconazole, and tetraconazole; Appendix 1). For modeling, myclobutanil was chosen because it has the

highest annual application rates for non-agricultural (turf grass) and agricultural crop (apples) uses of all conazole fungicides. Myclobutanil has a maximum application rate of 1.73 lbs ai/acre applied six times per season in 14 day intervals. The maximum application rate on apples is 0.25 lb ai/acre applied eight times per season or 1.0 lb ai/acre applied twice per season in 7 day intervals. This assessment may require revision if new uses are for sites not already addressed by the current list of registered or proposed uses, if the application rates of the fungicides exceed 10.38 lb a.i./acre annually for non-agricultural uses and 2.0 lb a.i./acre annually for agricultural uses, or if the formation of the metabolites exceeds 30.7%.

Two aerobic soil metabolism half-lives were used in the modeling. Since it is not expected that the 1,2,4-triazole concentrations will reach 50 ppm levels in soil, a half-life for this concentration of 1,2,4-triazole was considered in the calculation of the input parameter in one modeling scenario and not considered in another. Upper 90th percentile confidences bound of the mean metabolism half-life from all half-lives available and from all but the highest concentration (50 ppm) half-life were used (Table 3). Tables 4 and 5 list the modeling input parameters.

Table 4. Environmental Fate and Chemistry Input Parameters for 1,2,4-Triazole

Parameters	Input Value and Unit	Source of Info/Reference
Maximum per event Application Rates (Product Labels) by crop modeled <sup>1</sup>	Golf Course Turf: 0.13 lb ai/A (0.14 kg ai/ha) 0.095 lb ai/A (0.107 kg ai/ha)  Apples: 0.018 lb ai/A (0.0205 kg ai/ha) 0.073 lb ai/A (0.082 kg ai/ha)	<u>Product Labels:</u>  Product label: EPA Reg. No. 62719-417 Product label: EPA Reg. No. 62719-417 and 707-232  Product label: EPA Reg. No. 701-221 Product label: EPA Reg. No. 62719-417
Maximum Number of Applications	Golf Course Turf = 6 Apples = 8 Apples = 2	Product label: EPA Reg. No. 62719-417 and 707-232 Product label: EPA Reg. No. 701-221 Product label: EPA Reg. No. 62719-417
Minimum interval between applications	Golf Course Turf = 14 days Apples = 7 days	Product labels as above
Method of Application	Turf = ground Apples = ground	degrade formed after application of parent CAM = 2 and incorporation depth = 0.1 cm
Soil Partition Coefficient ( $K_f$ ) <sup>2</sup>	0.72	MRID 40891501 (GLN 163-1)
Molecular Weight	69.07 g/mole	MRID 45574104
Solubility (pH 7, 20 °C) <sup>3</sup>	7,000,000 mg/l	MRID 45574104 (GLN 63-7)
Vapor Pressure at 20 °C	$1.65 \times 10^{-3}$ mm Hg	MRID 45574104 (GLN 63-9)
Henry's Law Constant at 20 °C	$1.97 \times 10^{-10}$ atm·m <sup>3</sup> /mol	MRID 45574104 (GLN 63-8)
Aerobic Soil Metabolism $T_{1/2}$	250 days <sup>4</sup>	MRIDs: 45284032, 45297203, and 45284027
	107 days <sup>5</sup>	MRIDs: 45284032 and 45284027 (GLN 162-1)
Aqueous Photolysis (pH 5) $T_{1/2}$	stable	MRID 45284026 (GLN 161-2)
Hydrolysis $T_{1/2}$ (pH)		

Parameters	Input Value and Unit	Source of Info/Reference
Aerobic aquatic metabolism half-life	161 days 500 days <sup>6</sup> 214 days <sup>7</sup>	assumed 2 x aerobic soil metabolism half-life input value because the compound is stable to hydrolysis and no aerobic aquatic metabolism data are available (Guidance for Selecting Input Parameters in Modeling the Environmental Fate and Transport of Pesticides; Feb 2, 2002)
Anaerobic aquatic metabolism half-life <sup>8</sup>	504 days	assumed 2 x anaerobic soil metabolism half-life multiplied by three ( $T_{1/2}$ = days, MRID 45930701) because no anaerobic aquatic metabolism data are available and the compound is stable to hydrolysis (Guidance for Selecting Input Parameters in Modeling the Environmental Fate and Transport of Pesticides; Feb 2, 2002)

<sup>1</sup> – 1,2,4-Triazole application was obtained from molecular weight conversion times myclobutanil application rate times max percent formation rate (turf =  $(69.0/288.78) * 1.73 * 0.307$ ; crop =  $(69.0/288.78) * 0.25 * 0.307$ ).

<sup>2</sup> – The lowest non-sand Kf value was used.

<sup>3</sup> – The water solubility was multiplied by 10.

<sup>4</sup> – Upper 90 percentile confidence bound of the mean metabolism half-life from all half-lives available ( $t_{1/2}$  (6) = 26.5; 46.7; 22.2; 343, 375; and 155 days) was used.

<sup>5</sup> – Upper 90 percentile confidence bound of the mean metabolism half-life and from all but the highest concentration half-lives ( $t_{1/2}$  (4) = 26.5; 46.7; 22.2; and 155 days) was used.

<sup>6</sup> – Aerobic soil metabolism half-life input x 2 =  $250 * 2 = 500$  days

<sup>7</sup> – Aerobic soil metabolism half-life input x 2 =  $107 * 2 = 214$  days

<sup>8</sup> – Only one anaerobic soil metabolism half-life was available (84 days, MRID 45930701)

Table 5. Additional PRZM-EXAM Input Parameters for 1,2,4-Triazole

Parameters	Input Value and Unit	Source of Info/Reference
First Application Date (day-month)	PA Golf Course Turf = 07-05 FL Golf Course Turf = 07-06 PA Apples = 01-05 NC Apples = 01-05	Assumed based on crop profile and planting dates data from the PRZM crop scenarios
Rainfall Data (Metfile)	PA Golf Course Turf = W14737.dvf FL Golf Course Turf = W12834.dvf PA Apples = W14737.dvf NC Apples = W03812.dvf	
Application Fraction	Golf Course Turf = 1.0 Apples = 1.0	Assumed since 1,2,4-Triazole is formed in soil from parent fungicides
Spray Drift Fraction	Golf Course Turf = 0 Apples = 0	Degradate formed in soil from applied parent

The highest concentrations were obtained for ground applications of myclobutanil to PA golf course turf at the maximum annual application rate of 10.38 lb a.i./acre, applied six times at 1.73 lb a.i./acre with an interval between applications of fourteen days. The predicted 1 in 10 year annual peak concentrations of 1,2,4-triazole in drinking water from surface water for PA turf should not exceed 41.0 µg/L. The estimated 1 in 10 year annual mean concentration of 1,2,4-triazole in drinking water should not exceed 11.0 µg/L. The 30-year annual mean concentration should not exceed 2.7 µg/L. Both peak and annual average concentrations for all other scenarios were lower. From agricultural uses, the estimated 1 in 10 annual peak concentration of 1,2,4-triazole should not exceed 16.7 µg/L

(NC apples). The estimated 1 in 10 year annual mean concentration of 1,2,4-triazole should not exceed 3.2 µg/L, and the 30-year annual mean concentration should not exceed 1.3 µg/L (NC apples).

Table 6 lists estimated drinking water concentrations from surface water sources for golf course and apple scenarios. As the estimated results show the change of the aerobic soil metabolism half-life input parameter from 250 days to 107 days did not substantially change predicted concentrations.

Table 6. 1,2,4-Triazole estimated drinking water concentrations from surface water sources.

Scenario	Annual Fungicide Application Rate (lb ai/acre)	Aerobic soil metabolism T1/2	Estimated Drinking Water Concentrations (ppb)		
			1 in 10 year annual peak	1 in 10 year annual mean	36 year annual mean
PA golf course turf (PCA = 1)	1.73 x 6 = 10.38	107 days 250 days	40.6 41.0	10.1 11.0	2.45 2.69
	1.3 x 6 = 7.8	107 days 250 days	31.1 31.4	7.71 8.42	1.87 2.06
	1.73 x 6 = 10.38	107 days 250 days	10.1 10.6	1.63 1.91	0.53 0.64
	1.3 x 6 = 7.8	107 days 250 days	7.70 8.09	1.25 1.45	0.41 0.49
PA apples (PCA = 0.87)	1.0 x 2 = 2.0	107 days 250 days	4.85 4.95	1.39 1.51	0.75 0.83
	0.25 x 8 = 2.0	107 days 250 days	5.79 5.92	1.53 1.66	0.82 0.91
	1.0 x 2 = 2.0	107 days 250 days	16.5 16.7	2.92 3.21	1.24 1.34
	0.25 x 8 = 2.0	107 days 250 days	16.4 16.5	2.88 3.17	1.22 1.32

### Assumptions and Uncertainties

There is an uncertainty associated with the aerobic soil metabolism input parameter. According to the laboratory studies 1,2,4-triazole aerobic soil metabolism half-life appears to be concentration dependent. To account for that, the upper 90 percentile confidence bound of the mean metabolism half-life from all half-lives available ( $t_{1/2}(6) = 26.5; 46.7; 22.2; 343, 375; \text{ and } 155$  days) and from all but the highest concentration half-lives ( $t_{1/2}(4) = 26.5; 46.7; 22.2; \text{ and } 155$  days) were used. According to the registrant, the likelihood that triazole concentration in soil will approach 50 ppm is very small,

hence the half-life at that concentration should be omitted. As the modeling results show (Table 6) there is little significant difference between the EECs estimated from the aerobic soil metabolism half-life of 107 days versus 250 days. The Tier II modeling becomes increasingly insensitive to increases in half-life as it approached 100 days, so any effect is small. The half-life uncertainties do not impact prediction of concentrations.

This assessment does not consider applications of multiple conazole fungicides in the same season at the same site. There is unknown uncertainty associated with maximum 1,2,4-triazole formation from parent fungicides due to the lack of complete formation and decline curves in many laboratory studies. Although, the submitted laboratory studies showed that 30.7% is the maximum formation of 1,2,4-trizole (triadimefon, Table 1, Appendix 1) there is not enough data to state if it is a high or low estimate.

EFED conducted Tier II modeling of one crop-use and one non-crop use at their highest proposed label rates. Because conazole fungicides have a broad spectrum of crop and non-crop uses in some regions it may be applied to multiple crops and non-crops within a single watershed. In general, the likelihood that multiple crops will be found within single watersheds where conazole fungicides are used is unknown and therefore specific PCA adjustment factors were not used and each apple scenario was adjusted with the default PCA of 0.87. The potential to underestimate environmental concentrations may be associated with the application of the default PCA when uses on turf grass are co-located with the other non-crop uses and crop uses.

Within each scenario a change of conazole fungicide application dates or rainfall pattern may influence the modeling results. Conazole fungicide application dates were selected based on each crop and non-crop profile and their planting dates from the PRZM crop scenarios.

### **Triazole Alanine and Triazole Acetic Acid**

No environmental fate data were specifically submitted for triazole conjugates. Consequently, it was assumed that both conjugates, triazole alanine and triazole acetic acid, have similar fate characteristics to that of 1,2,4-triazole. This approach is expected to provide a conservative estimate of drinking water concentrations for the triazole conjugates. Triazole alanine and triazole acetic acid EECs were derived assuming 100% conversion from 1,2,4-triazole to conjugates using molecular weight conversion from 1,2,4-triazole to triazole conjugates.

Table 7. Triazole Acetic Acid estimated drinking water concentrations from surface water sources.

Scenario	Annual Fungicide Application Rate (lb ai/acre)	Aerobic soil metabolism T <sub>1/2</sub>	Estimated Drinking Water Concentrations <sup>1</sup> (ppb)		
			1 in 10 year annual peak	1 in 10 year annual mean	36 year annual mean
PA golf course turf	1.73 x 6 = 10.38	107 days 250 days	74.7 75.4	18.6 20.2	4.51 4.95
	1.3 x 6 = 7.8	107 days 250 days	57.2 57.8	14.2 15.5	3.44 3.79
	1.0 x 2 = 2.0	107 days 250 days	30.4 30.7	5.37 5.91	2.28 2.47
	0.25 x 8 = 2.0	107 days 250 days	30.2 30.4	5.30 5.83	2.24 2.43

– F-T EECs were multiplied by molecular conversion factor of 1.84 (MW<sub>TAA</sub>/ MW<sub>1,2,4-triazole</sub> = 1.84).

Although in the triazole soil metabolism study triazole alanine was detected only infrequently as a degradation product, triazole alanine was considered in this assessment. It was concluded that not enough information is available to preclude the conjugate as not ever being formed in the soil compartment.

Table 8. Triazole Alanine estimated drinking water concentrations from surface water sources.

Scenario	Annual Fungicide Application Rate (lb ai/acre)	Aerobic soil metabolism T <sub>1/2</sub>	Estimated Drinking Water Concentrations (ppb)		
			1 in 10 year annual peak	1 in 10 year annual mean	36 year annual mean
PA golf course turf	1.73 x 6 = 10.38	107 days 250 days	91.8 92.7	22.8 24.9	5.54 6.08
	1.3 x 6 = 7.8	107 days 250 days	70.3 71.0	17.4 19.0	4.23 4.66
	1.0 x 2 = 2.0	107 days 250 days	37.3 37.7	6.60 7.27	2.80 3.03
	0.25 x 8 = 2.0	107 days 250 days	37.1 37.3	6.51 7.16	2.76 2.98

– F-T EECs were multiplied by molecular conversion factor of 2.26 (MW<sub>TA</sub>/ MW<sub>1,2,4-triazole</sub> = 2.26).

The assumption of 100% formation of TAA and TA from 1,2,4-triazole may be highly conservative estimates of drinking water concentrations. Preliminary PDP monitoring data showed infrequent and very low residue levels (Table 8). The PDP monitoring, however, was not designed to target high use of conazole fungicide, hence the data are not representative of a worse case drinking water scenario.

Table 9. Preliminary Residue Data for 1,2,4-Triazole, Triazole Alanine, and Triazole Acetic Acid

Commodity	1,2,4-Triazole			Triazole Alanine			Triazole Acetic Acid		
	# of detects	# of samples	Max., ppm	# of detects	# of samples	Max., ppm	# of detects	# of samples	Max., ppm
Finished Water	0	141	---	0	141	---	3	141	0.00005

## B. Ground Water Assessment

Two small scale prospective ground water monitoring studies were conducted for triadimefon in NJ and CA. These studies indicate 1,2,4-triazole residues were detected in pore water at 9 and 12 ft depth. The highest concentration in pore water at 9 ft was detected in New Jersey (Dyer, 2001). The average maximum free triazole concentration (663-day mean) was 16.7 ppb. In this NJ study, triadimefon was applied to turf twice at 3 lbs ai/acre about a month apart in June and July of 1997.

Table 10 lists the modeling input parameters and Table 11 shows the model predicted environmental concentrations in the drinking water from ground water sources. The SCI-GROW predicted drinking water concentrations for 1,2,4-triazole in shallow ground water are significantly lower than those from the small scale prospective ground water monitoring study conducted on NJ turf.

Table 10. SCI-GROW Input Parameters for 1,2,4-Triazole

Parameter	Input Value and Units	Additional Comments
Maximum Application Rate	Golf Course Turf: 0.13 lb ai/acre 0.095 lb ai/acre  Apples: 0.018 lb ai/acre 0.073 lb ai/acre	<u>Product Labels:</u>  Product label: EPA Reg. No. 62719-417 Product label: EPA Reg. No. 62719-417 and 707-232  Product label: EPA Reg. No. 701-221 Product label: EPA Reg. No. 62719-417
Max Number of Applications per year	Golf Course Turf = 6 Apples = 8 Apples = 2	Product label: EPA Reg. No. 62719-417 and 707-232 Product label: EPA Reg. No. 701-221 Product label: EPA Reg. No. 62719-417
Partition Coefficient Normalized to Organic Carbon Content <sup>1</sup> - K <sub>oc</sub>	104 L kg <sub>soil</sub> <sup>-1</sup>	MRID 40891501 (GLN 163-1)
Aerobic Soil Metabolism <sup>2</sup> t <sub>1/2</sub>	101 days 36 days	MRIDs: 45284032, 45297203, and 45284027 (GLN 162-1) MRIDs: 45284032 and 45284027

<sup>1</sup> 1,2,4-Triazole application was obtained from molecular weight conversion times myclobutanil application rate times max percent formation rate (turf =  $(69.0/288.78) * 1.73 * 0.307$ ; crop =  $(69.0/288.78) * 0.25 * 0.307$ ).

<sup>2</sup> The median Koc value from five values available (i.e. Koc = 120, 43, 202, 104 and 89) was used.

<sup>3</sup> The median half-life value of all values available ( $t_{1/2}$  (6)= 26.5; 46.7; 22.2; 343, 375; and 155 days) and of all values but the once for highest concentration ( $t_{1/2}$  (4)= 26.5; 46.7; 22.2; and 155 days) were used. These are 101 and 36 days, respectively.

Table 11. 1,2,4-Triazole estimated drinking water concentrations from ground water sources.

Scenario	Annual Fungicides Application Rate	Aerobic soil metabolism $T_{1/2}$	Estimated Drinking Water Concentrations (ppb)
Turf	$1.73 \times 6 = 10.38$ lb ai/acre	101 days 36 days	1.06 0.27
	$1.3 \times 6 = 7.8$ lb ai/acre	101 days 36 days	0.77 0.20
Apples	$1.0 \times 2 = 2.0$ lb ai/acre	101 days 36 days	0.20 0.051
	$0.25 \times 8 = 2.0$ lb ai/acre	101 days 36 days	0.22 0.056

## REFERENCES

Dyer, D. 2001. Bayer report No. 109372. Triadimefon Small Scale Prospective Ground Water Monitoring Study in New Jersey, 1997.

McCall P.J., Swann R.L., Laskowski D.A., Unger S.M., Vrona S. A. and Dishburger H.J. Estimation of Chemical Mobility in Soil from Liquid chromatographic Retention Times. 1980 Bull. *Environ. Contam. Toxicol.* **24**, pp190-195.

## Attachment I

Table 1. Maximum 1,2,4-triazole formation from parent fungicides.

Triazole Fungicides	% formation rate			data source MRID # and study type
	free 1,2,4-triazole	trizolylalanine	trizolylacetic acid	
Tebuconazole	9	NA	NA	Bayer Report # 103804
Triadimefon	30.7	NA	NA	MRD 42224104
Triadimenol		NA	NA	
Propiconazole	23.6	NA	NA	NA
Myclobutanil	18	NA	NA	MRID 00141680
Prothioconazole	37.2% <sup>1</sup> in water and 6.1% <sup>1</sup> in soil total max 41.8% <sup>1</sup>	NA	NA	MRID 46246515; 162-4
Fenbuconazole	12.4	NA	NA	MRID 41031247
Tetraconazole	6.63 3.7 (112 days)	NA 4.9 (112 days) <sup>1</sup>	NA NA	MRID 44367003; 161-2 MRID 44367004; 161-3

NA: not available

NS: the degradates were not studied in the field dissipation studies

<sup>1</sup> last sampling interval

## Attachment II

Table 3. Environmental Fate Data Submitted for 1,2,4-Triazole

Guideline #	Data Requirement	MRID #'s	Study Classification
161-1	Hydrolysis	00133373	supplemental
161-2	Photodegradation in Water	45284026	supplemental
161-3	Photodegradation on Soil		
161-4	Photodegradation in Air		
162-1	Aerobic Soil Metabolism	45297203 45284038 45284032 45284027 45284023	supplemental
162-2	Anaerobic Soil Metabolism	45930701	acceptable <sup>1</sup>
162-3	Anaerobic Aquatic Metabolism		waiver request
162-4	Aerobic Aquatic Metabolism		waiver request
163-1	Leaching-Adsorption/Desorption	00133384 40891501 00133372 45284030	invalid acceptable supplemental supplemental
163-2	Laboratory Volatility		
163-3	Field Volatility		
164-1	Terrestrial Field Dissipation	45284025 00164564	both marginally supplemental
164-2	Aquatic Field Dissipation		
164-3	Forestry Dissipation		
165-4	Accumulation in Fish		
165-5	Accumulation- aquatic non-target		
166-1	Ground Water- small prospective		
166-2	Ground Water- small retrospective		
201-1	Droplet Size Spectrum		
202-1	Drift Field Evaluation		

<sup>1</sup> - Study currently under review

## **Attachment III**

### **Summary of registrant submitted laboratory and field studies**

#### **Hydrolysis**

Ring-labeled [ $\text{U}-^{14}\text{C}$ ]-1,2,4-H-triazole at nominal concentrations of 10  $\mu\text{g}/\text{mL}$ , was hydrolytically stable in sterile pH 5, 7 and 9 aqueous buffer solutions incubated in darkness at 25 °C for up to 30 days. The reviewer-calculated half-lives were 133 days ( $r^2=0.48$ ), 161 days ( $r^2=0.51$ ), and 114 days( $r^2=0.30$ ), respectively. This study is non-upgradable supplemental because the material balances were incomplete in all three solutions and there was no attempt to collect volatiles from the test solutions. (MRID 00133373)

#### **Photodegradation in Water**

[ $^{14}\text{C}$ ]-1,2,4-H-triazole present in distilled water and in Fluca humic acid solution containing 5% (v/v) acetonitrile each, at a nominal concentration of 80 ppm, was stable to photodegradation, when exposed to natural sunlight, of unknown intensity and daylight duration, for up to 30 days.

This study is upgradable marginally supplemental because the wavelength, intensity and hours of sunlight per day were not reported, the temperatures during the study were not reported, and there was no attempt to collect volatiles from the test solutions. (MRID 45284026)

#### **Metabolism - Aerobic Soil**

##### **MRID 45297203**

Five separate experiments were conducted to study 1,2,4-triazole aerobic soil metabolism. In one experiment at a nominal application rate of 94 mg triazole/100 g soil 1,2,4-[3,5- $^{14}\text{C}$ ]triazole was stable (no  $\text{CO}_2$  was formed and organic volatiles were 5.84%, and 9.74%) when incubated for one year under aerobic soil conditions. In another experiment at an application rate of 5 mg triazole/100 g soil [ $^{14}\text{C}$ ]triazole degraded to form acetic acid at the maximum of 7.8% and 18.0% of the APR at 98 days posttreatment (PTT). Unextracted [ $^{14}\text{C}$ ] residues reached maximums of 44.1% (2.3 soil) and 48.0% (2.2 soil) of the APR at 293 days PTT. In the third experiment triazole treated soil at an application rate of 14 mg triazole/kg soil was sown with wheat. Triazole uptake by wheat reached 61.1-61.3% by 60-90 days posttreatment, triazolyl acetic acid reached a maximum of 2.3% of the applied at 30 days posttreatment, and unextracted [ $^{14}\text{C}$ ]residues were a maximum of 31.1% of the applied at 30 days PTT. In the forth experiment the soil was treated with [ $^{14}\text{C}$ ]triazole or [ $^{14}\text{C}$ ]triazolyl alanine (5 mg of triazole or triazolyl alanine/100 g soil) and incubation at 22 °C for 60 days. Following 60 days posttreatment, extracted residues accounted for 59.4-64.1%, unextracted residues accounted for 33.5-36.0% of the applied radioactivity, and evolved  $^{14}\text{CO}_2$  accounted for 1.16-1.19%

(triazole) and 0.77% (triazolyl alanine). Sixth experiment showed that 240 mg of [<sup>14</sup>C]triazole was almost completely metabolized by a bacteria culture (*Nocardia corallina*) in 14 days and triazolyl alanine was the principal metabolite isolated from the culture.

#### MRID 45284038

In series of seven experiments (Experiments I, II, and IV conducted on Burscheid I silt loam; Experiment III on Burscheid II silt loam; and Experiments V-VII Leifers silt loam) it was found that triazole degradation in soil was microbial in nature, based on high rates of mineralization (<sup>14</sup>CO<sub>2</sub> = 56-70% of the applied at 360 days) in low-dosed (0.9 µg/100 g soil) nonsterile silt loam soils and the lack of mineralization in similarly-treated sterile silt loam soil. In high-dosed (ca. 5 mg/100 g soil) nonsterile silt loam soils the rates of mineralization were slow, evolved <sup>14</sup>CO<sub>2</sub> accounted for no more than 4.5% of the applied at 360 days. Three 1,2,4-triazole degradates: hydroxytriazole (3-hydroxy-1,2,4-triazole), triazolyl alanine (1,2,4-triazole-1-alanine); and triazolyl acetic acid; were identified. All test data were not sufficient for calculation of 1,2,3-triazole soil metabolism half-lives.

#### MRID 45284032

1,2,4-Triazole, at an application rate of 6.05-6.20 µg/100 g dry soil, degraded with an EFED-calculated half-lives ( $t_{1/2}$ ) of 22.2-46.7 days ( $r^2 = 0.99$  to 0.63) in three soils (Laacher Hof AXXa sandy loam, BBA 2.2 loamy sand, and Laacher Hof A III silt loam). During the experiment samples were maintained in darkness at  $20 \pm 2^\circ\text{C}$  and 40% of their water holding capacity for up to 120 days. The degradates identified via TLC were [1,2,4]triazole-1-yl-acetic acid and [1,2,4]triazole-hydroxy. [1,2,4]Triazole-1-yl-acetic acid was a maximum of 0.27%-6.93% of the applied at 14 days posttreatment (sandy loam). [1,2,4]Triazole-hydroxy was present at a maximum of 1.03-2.61% of the applied at 14 days posttreatment (silt loam). Unextracted [<sup>14</sup>C]residues were a maximum of 61.64-74.64% of the applied at different day post application for different soil, and decreased to 38.47-66.16% at 120 days. <sup>14</sup>CO<sub>2</sub> comprised 1.42-33.70% of the applied at 120 days PPT.

#### MRID 45284027

[3,5-<sup>14</sup>C]1,2,4-Triazole, at 1 ppm, degraded with a reviewer-calculated first order kinetics half-life ( $t_{1/2}$ ) of 22 weeks (155 days;  $r^2 = 0.96$ ) in silty loam soil that was moistened to 75% of the field capacity and incubated in the dark at  $25^\circ\text{C}$  for up to 168 days. Based on TLC analysis, triazole was 78.7% of the applied at time 0, 65.2% (including 4.6% of bound residues) at 28 days, 52.5% (including 9.3% of bound residues) at 56 days, and 36.3% (including 6.7% of bound residues) at 168 days posttreatment. Unidentified degradates were a maximum of 8.9% of the applied at time zero. <sup>14</sup>CO<sub>2</sub> totaled 1.9% of the applied at 168 days and organic [<sup>14</sup>C] volatiles were a maximum of 2.6% of the applied at 56 days posttreatment. Unextracted [<sup>14</sup>C] residues comprised 62.4% of the applied at 168 days posttreatment. Following further soil extraction with methanol/NaOH 0.1 N (4:1), an additional 10.6-17.1% of the applied radioactivity was extracted; 4.6-9.3% was identified as triazole and 1.5-5.8% were two unidentified degradates (unknown X and Z). Material balances ranged from 93.4 to 102.9% of the applied during the study.

MRID 45284023

The aerobic metabolism of [3,5-<sup>14</sup>C]1,2,4-triazole was studied in calcareous clay loam ('Gore') and coarse sandy loam ('18 Acres') soils that were treated at a nominal rate of 12.9 g/ha, and incubated at 25°C and 40% of moisture holding capacity at zero suction for 12 or 20 weeks. It was not stated if the samples were incubated in darkness. At each sampling interval single soil samples were analyzed for triazole using one-dimensional TLC. Evolved <sup>14</sup>CO<sub>2</sub> was higher in the 'Gore' soil (48.8% of the applied) than in the '18 Acres' soil (8.6% applied) at 20 weeks posttreatment. Unextracted [<sup>14</sup>C] residues were a maximum of 55.2% of the applied at 12 weeks and were 48.2% at 20 weeks in the 'Gore' soil, and 68.3% of the applied at 20 weeks in '18 Acres' soil.

#### Metabolism - Anaerobic Soil

After four days of aerobic incubation [<sup>14</sup>C]1,2,4-triazole treated silt loam soil (46 g triazole/ha) was flooded with distilled water and ventilated with nitrogen to simulate anaerobic conditions. During incubation duplicate samples were taken directly after treatment and after 3, and 4 days of aerobic incubation, and then 5, 7, 14, 27, 60, and 122 days after treatment during anaerobic incubation. The study showed that under anaerobic soil conditions 1,2,4-triazole metabolized slowly with half-life of 84 days to 1,2,4-triazolyl acetic acid (50.3% after 122 days) and other minor byproducts (e.g. 2-amino-3[1,2,4]triazol-1-yl-propionic acid). At the end of the study unextracted residues were 16.3% of the applied radioactivity. (MRID 45930701)

#### Mobility - Adsorption/Desorption

The mobility of [3,5-<sup>14</sup>C]1,2,4-triazole, at nominal concentrations of 0.1, 0.05, 0.01, and 0.005 ppm, was investigated in five domestic soils (sand, sandy loam, silty clay loam, clay loam, and silty clay). Based on the preliminary experiments, equilibration periods of 95 hours for adsorption and 46 and 24 hours for desorption (2 desorption phases) were chosen, and because of the low absorption of 1,2,4-triazole, water:soil ratios of 5:1 to 2:1 (v:w) were chosen for use in the final experiment. Slurries were equilibrated by shaking at 25 ± 1°C. Aliquots of the adsorption and desorption supernatants were analyzed for total radioactivity by LSC, and soil pellets were analyzed by LSC following combustion.

Freundlich K<sub>ads</sub> values were 0.833 for the silty clay soil, 0.748 for the clay loam soil, 0.234 for the sand soil, 0.722 for the silty clay loam soil, and 0.722 for the sandy loam soil. Corresponding K<sub>oc</sub> values were 120, 43, 202, 104, and 89, respectively. EFED notes that the Freundlich adsorption coefficient may not be an adequate representation of adsorption across all concentrations and it cannot be assumed that K<sub>f</sub> is equal to K<sub>d</sub> (1/n = 0.827-0.897 for the silty clay, clay loam, and sand soils). For the first and second desorption phases, Freundlich K<sub>des</sub> values were 0.61-2.13 and 1.86-7.93, respectively. Reviewer-calculated coefficients of determination ( $r^2$ ) for the relationships K<sub>ads</sub> vs.

organic matter,  $K_{ads}$  vs. pH, and  $K_{ads}$  vs. clay content were 0.397, 0.831, and 0.724, respectively. This study indicate that 1,2,4-triazole has high mobility potential in all studied soils (McCall *et al.*, 1980). (MRID 40891501)

#### Mobility - Leaching

[<sup>14</sup>C]1,2,4-Triazole, dissolved in methanol, was applied to single soil columns containing one U.S. soil (Lakeland pure sand) and three Swiss soils (Collombey sandy, Vertroz sandy loam, and Les Ecouettes silty loam), at a nominal application rate equivalent to 5 kg a.i./ha. The soil columns contained 30 cm of test soil and were leached with 200 mm of artificial rainwater over a period of 48 hours. In the Lakeland sand soil (o.m. 1.0%) and Collombey sandy soil (o.m. 1.4%), [<sup>14</sup>C]residues totaled 17.2 to 18.3% of the applied in the 0- to 30-cm depth; and 81.6 to 86% of the applied was recovered in the leachate. In the Vertroz sandy loam soil (o.m. 9.3%), [<sup>14</sup>C]residues totaled 105.36% of the applied in the 0- to 30-cm depth, with 69.14% in the 20- to 30-cm depth; 0.59% of the applied was recovered in the leachate. In the Les Ecouettes silty loam soil (o.m. 2.6%), [<sup>14</sup>C]residues totaled 62.29% of the applied in the 0- to 30-cm depth, with 40.02% in the 20- to 30-cm depth; 34.07% of the applied was recovered in the leachate. Material balances for the four test soils ranged from 96.36% to 105.96% of the applied.

In this study the leaching solution was not characterized and other details of the experimental design were missing. All data were reported as total radioactivity present in the soil extracts and the unextractable [<sup>14</sup>C]residues, and was assumed that the radioactivity was 1,2,4-triazole. (MRID 00133372)

#### Mobility - Leaching

The soil mobility (column leaching) of [3,5-<sup>14</sup>C]1,2,4-triazole, at a nominal rate of 1 ppm, was studied in aged (31-32 days) silt loam soil (o.m. 1.0%) and sandy loam soil (o.m. 2.3%) columns that were leached with 2255 mL of water over a period of 43 or 91 days. Following the incubation period, the mean concentration of [<sup>14</sup>C]1,2,4-triazole was 0.95 ppm for the silt loam soil and 1.08 ppm for the sandy loam soil. Following the 91-day leaching period for silt loam soil and the 43-day leaching period for sandy loam soil in both soils, 54-58% of the applied radioactivity remained in the soil columns, approximately half of which was in the upper 5 cm and 9-13% in the 22.5-30-cm depth. Radioactivity in the leachates of both test soils comprised 42-46% of the applied. Triazole acetic acid was identified in leachates of both test soils; an unidentified degradate was also isolated in the sandy loam soil. The material balances for the two test soils were 101.8-103.4% of the applied for silt loam soil and 87.2-90.6% of the applied for sandy loam soil.

The study had many shortcomings that included but not limited to the soil moisture content not being maintained at 75% of 0.33 bar during the aging process and the leaching was not continuous process; the soils were leached for periods of 1-2 hours for

3-5 days/week. An unknown degradate ( $R_f=0.63$ ; silt loam) present in leachate was isolated but not identified. (MRID 45284030)

#### Dissipation - Terrestrial Field

The study provided supplemental information that C<sup>14</sup> residues of 1,2,4-triazole dissipated from the top 3" soil layer with a first order kinetics linear half-life of 231 days and the top of 36" soil layer with the half-life of 381 days after a nominal application rate of 0.25 lb a.i./A to vineyard silt loam soil (16% sand, 20% clay, 64% silt, pH 6.9, 2.4% organic matter, CEC 7.1) in Newton, PA. The soil samples were analyzed only for total [<sup>14</sup>C]residues and according to the author the sampling method led to contamination of the lower soil layers. (MRID 45284025)

#### Dissipation - Terrestrial Field

After two field application of 0.25 lb of 1,2,4-triazole/acre onto winter wheat in Pennsylvania and Mississippi 1,2,4-triazole leached to at least 12 inches soil depth throughout the course of the study (PA soil: 363 days; MS soil: 639 days). The soil samples were not analyzed below 12 inches of soil depth, the application rate was not confirmed, and the soil spike recoveries were very low in PA soil and low in MS soil, therefore, 1,2,4-triaozle dissipation half-life could not be estimated with acceptable confidence. (MRID 00164564)

## Attachment IV

### PRZM-EXAMS Output Files

#### Turf Application in PA at 1.3 lb ai/acre applied six times (aerobic half-life 107 days)

stored as triazolePAturfl07.out

Chemical: triazole

PRZM environment: PAturfc.txt modified Monday, 24 November 2003 at 14:49:51

EXAMS environment: ir298.exv modified Thursday, 29 August 2002 at 16:34:12

Metfile: w14737.dvf modified Wednesday, 3 July 2002 at 10:06:12

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.0376	0.03704	0.03484	0.02081	0.01388	0.003421
1962	32.07	31.61	30.58	26.62	17.75	4.386
1963	21.91	21.6	20.37	17.89	16.25	8.009
1964	3.879	3.826	3.611	3.177	2.89	1.547
1965	2.008	1.98	1.867	1.639	1.49	0.6909
1966	0.1228	0.1211	0.1146	0.1012	0.09223	0.048
1967	7.62	7.51	7.066	6.206	4.139	1.038
1968	4.998	4.928	4.647	4.081	3.707	1.909
1969	1.437	1.417	1.337	1.175	1.069	0.4954
1970	5.61	5.55	5.373	4.636	3.094	0.7923
1971	53.19	52.41	49.26	43.04	29.2	8.468
1972	34.15	33.67	31.75	27.89	25.34	14.01
1973	14.61	14.41	13.59	11.94	10.84	5.015
1974	0.8984	0.8865	0.8383	0.7403	0.6747	0.3177
1975	2.2	2.166	2.032	1.53	1.023	0.2758
1976	3.431	3.383	3.186	1.381	1.128	0.7276
1977	10.46	10.3	9.677	7.902	5.362	2.237
1978	7.016	6.918	6.523	5.728	5.205	2.408
1979	0.4225	0.4169	0.3943	0.3482	0.3172	0.1497
1980	0.1499	0.1477	0.139	0.0841	0.05725	0.02561
1981	0.1141	0.1125	0.1061	0.09305	0.08446	0.03892
1982	4.981	4.906	4.605	3.907	2.605	0.6446
1983	3.245	3.2	3.017	2.65	2.406	1.234
1984	1	0.9866	0.9306	0.8173	0.7428	0.3438
1985	0.3537	0.3484	0.3277	0.2317	0.1566	0.05828
1986	0.4879	0.4816	0.458	0.3922	0.27	0.1481
1987	1.579	1.555	1.463	1.153	0.7801	0.3009
1988	1.449	1.428	1.342	0.9015	0.8165	0.5108
1989	1.071	1.056	0.9954	0.8736	0.7935	0.3676
1990	0.06477	0.0639	0.06036	0.0532	0.04843	0.02264

#### Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	53.19	52.41	49.26	43.04	29.2	14.01
0.0645161290322581	34.15	33.67	31.75	27.89	25.34	8.468
0.0967741935483871	32.07	31.61	30.58	26.62	17.75	8.009
0.129032258064516	21.91	21.6	20.37	17.89	16.25	5.015
0.161290322580645	14.61	14.41	13.59	11.94	10.84	4.386
0.193548387096774	10.46	10.3	9.677	7.902	5.362	2.408
0.225806451612903	7.62	7.51	7.066	6.206	5.205	2.237
0.258064516129032	7.016	6.918	6.523	5.728	4.139	1.909
0.290322580645161	5.61	5.55	5.373	4.636	3.707	1.547
0.32258064516129	4.998	4.928	4.647	4.081	3.094	1.234
0.354838709677419	4.981	4.906	4.605	3.907	2.89	1.038
0.387096774193548	3.879	3.826	3.611	3.177	2.605	0.7923
0.419354838709677	3.431	3.383	3.186	2.65	2.406	0.7276
0.451612903225806	3.245	3.2	3.017	1.639	1.49	0.6909
0.483870967741936	2.2	2.166	2.032	1.53	1.128	0.6446
0.516129032258065	2.008	1.98	1.867	1.381	1.069	0.5108
0.548387096774194	1.579	1.555	1.463	1.175	1.023	0.4954

0.580645161290323	1.449	1.428	1.342	1.153	0.8165	0.3676
0.612903225806452	1.437	1.417	1.337	0.9015	0.7935	0.3438
0.645161290322581	1.071	1.056	0.9954	0.8736	0.7801	0.3177
0.67741935483871	1	0.9866	0.9306	0.8173	0.7428	0.3009
0.709677419354839	0.8984	0.8865	0.8383	0.7403	0.6747	0.2758
0.741935483870968	0.4879	0.4816	0.458	0.3922	0.3172	0.1497
0.774193548387097	0.4225	0.4169	0.3943	0.3482	0.27	0.1481
0.806451612903226	0.3537	0.3484	0.3277	0.2317	0.1566	0.05828
0.838709677419355	0.1499	0.1477	0.139	0.1012	0.09223	0.048
0.870967741935484	0.1228	0.1211	0.1146	0.09305	0.08446	0.03892
0.903225806451613	0.1141	0.1125	0.1061	0.0841	0.05725	0.02561
0.935483870967742	0.06477	0.0639	0.06036	0.0532	0.04843	0.02264
0.967741935483871	0.0376	0.03704	0.03484	0.02081	0.01388	0.003421
0.1	31.054	30.609	29.559	25.747	17.6	7.7096
Average of yearly averages:						1.874102366666667

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazolePAturf107

Metfile: w14737.dvf

PRZM scenario: PAturfC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable	Name	Value	Units	Comments
Molecular weight	mwt	69.07	g/mol		
Henry's Law Const.	henry	1.97e-10	atm-m^3/mol		
Vapor Pressure	vapr	1.65e-3	torr		
Solubility sol	7.0e+6	mg/L			
Kd	Kd	0.72	mg/L		
Koc	Koc		mg/L		
Photolysis half-life	kdp	0	days	Half-life	
Aerobic Aquatic Metabolism	kbacw	214	days	Halfife	
Anaerobic Aquatic Metabolism	kbacs	504	days	Halfife	
Aerobic Soil Metabolism	asm	107	days	Halfife	
Hydrolysis:	pH 7	161	days	Half-life	
Method:	CAM	2	integer	See PRZM manual	
Incorporation Depth:	DEPI	0.1	cm		
Application Rate:	TAPP	.107	kg/ha		
Application Efficiency:	APPEFF	1.0	fraction		
Spray Drift	DRFT	0.0	fraction of application rate applied to pond		
Application Date	Date	07-05	dd/mm or dd/mmm or dd-mm or dd-mmm		
Interval 1 interval	14	days	Set to 0 or delete line for single app.		
Interval 2 interval	14	days	Set to 0 or delete line for single app.		
Interval 3 interval	14	days	Set to 0 or delete line for single app.		
Interval 4 interval	14	days	Set to 0 or delete line for single app.		
Interval 5 interval	14	days	Set to 0 or delete line for single app.		
Record 17:	FILTRA				
	IPSCND	1			
	UPTKF				
Record 18:	PLVKRT				
	PLDKRT				
	FEXTRC				
Flag for Index Res. Run	IR	IR			
Flag for runoff calc. RUNOFF	total	none, monthly or total(average of entire run)			

## Turf Application in PA at 1.3 lb ai/acre applied six times (aerobic half-life 250 days)

stored as triazolePAturf250new.out

Chemical: triazole

PRZM environment: PAturfC.txt modified Monday, 24 November 2003 at 14:49:51

EXAMS environment: ir298.exv modified Thursday, 29 August 2002 at 16:34:12

Metfile: w14737.dvf modified Wedday, 3 July 2002 at 10:06:12

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.04035	0.03979	0.03755	0.02249	0.015	0.003698
1962	32.34	31.89	30.99	27.16	18.11	4.476
1963	22.6	22.3	21.08	18.62	16.99	8.81
1964	4.485	4.427	4.189	3.707	3.387	1.886
1965	2.318	2.287	2.162	1.91	1.744	0.8541
1966	0.1891	0.1867	0.177	0.1571	0.1438	0.07633
1967	7.657	7.552	7.128	6.305	4.206	1.059
1968	5.138	5.069	4.793	4.233	3.863	2.089
1969	1.61	1.589	1.503	1.329	1.213	0.5949
1970	5.707	5.648	5.471	4.756	3.177	0.8295
1971	53.34	52.6	49.64	43.7	29.7	8.707
1972	35.14	34.67	32.78	28.96	26.43	15.26
1973	15.92	15.71	14.86	13.13	11.99	5.868
1974	1.32	1.304	1.235	1.096	1.003	0.4979
1975	2.289	2.257	2.127	1.613	1.081	0.311
1976	3.934	3.881	3.665	1.607	1.218	0.8312
1977	10.79	10.64	10.04	8.261	5.651	2.515
1978	7.406	7.307	6.908	6.102	5.568	2.724
1979	0.5992	0.5916	0.5607	0.4976	0.4553	0.2264
1980	0.1645	0.1622	0.1531	0.09419	0.06545	0.03675
1981	0.127	0.1253	0.1184	0.1045	0.0953	0.0465
1982	5.04	4.97	4.687	4.01	2.674	0.6628
1983	3.378	3.333	3.151	2.783	2.539	1.371
1984	1.134	1.119	1.058	0.9351	0.8537	0.4177
1985	0.3742	0.369	0.3486	0.2488	0.1701	0.07374
1986	0.5044	0.4983	0.4757	0.4101	0.2854	0.1634
1987	1.642	1.619	1.53	1.215	0.8256	0.3249
1988	1.572	1.55	1.463	0.995	0.8807	0.5737
1989	1.181	1.165	1.101	0.9722	0.887	0.434
1990	0.09559	0.09437	0.0894	0.07928	0.07251	0.03583

#### Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	53.34	52.6	49.64	43.7	29.7	15.26
0.0645161290322581	35.14	34.67	32.78	28.96	26.43	8.81
0.0967741935483871	32.34	31.89	30.99	27.16	18.11	8.707
0.129032258064516	22.6	22.3	21.08	18.62	16.99	5.868
0.161290322580645	15.92	15.71	14.86	13.13	11.99	4.476
0.193548387096774	10.79	10.64	10.04	8.261	5.651	2.724
0.225806451612903	7.657	7.552	7.128	6.305	5.568	2.515
0.258064516129032	7.406	7.307	6.908	6.102	4.206	2.089
0.290322580645161	5.707	5.648	5.471	4.756	3.863	1.886
0.32258064516129	5.138	5.069	4.793	4.233	3.387	1.371
0.354838709677419	5.04	4.97	4.687	4.01	3.177	1.059
0.387096774193548	4.485	4.427	4.189	3.707	2.674	0.8541
0.419354838709677	3.934	3.881	3.665	2.783	2.539	0.8312
0.451612903225806	3.378	3.333	3.151	1.91	1.744	0.8295
0.483870967741936	2.318	2.287	2.162	1.613	1.218	0.6628
0.516129032258065	2.289	2.257	2.127	1.607	1.213	0.5949
0.548387096774194	1.642	1.619	1.53	1.329	1.081	0.5737
0.580645161290323	1.61	1.589	1.503	1.215	1.003	0.4979
0.612903225806452	1.572	1.55	1.463	1.096	0.887	0.434
0.645161290322581	1.32	1.304	1.235	0.995	0.8807	0.4177
0.67741935483871	1.181	1.165	1.101	0.9722	0.8537	0.3249
0.709677419354839	1.134	1.119	1.058	0.9351	0.8256	0.311
0.741935483870968	0.5992	0.5916	0.5607	0.4976	0.4553	0.2264
0.774193548387097	0.5044	0.4983	0.4757	0.4101	0.2854	0.1634
0.806451612903226	0.3742	0.369	0.3486	0.2488	0.1701	0.07633
0.838709677419355	0.1891	0.1867	0.177	0.1571	0.1438	0.07374
0.870967741935484	0.1645	0.1622	0.1531	0.1045	0.0953	0.0465
0.903225806451613	0.127	0.1253	0.1184	0.09419	0.07251	0.03675
0.935483870967742	0.09559	0.09437	0.0894	0.07928	0.06545	0.03583
0.967741935483871	0.04035	0.03979	0.03755	0.02249	0.015	0.003698

0.1           31.366    30.931    29.999    26.306    17.998    8.4231

Average of yearly averages: 2.05864493333333

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazolePATurf250new

Metfile: w14737.dvf

PRZM scenario: PATurfC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	69.07	g/mol	
Henry's Law Const.	henry	1.97e-10	atm-m <sup>3</sup> /mol	
Vapor Pressure	vapr	1.65e-3	torr	
Solubility	sol	7.0e+6	mg/L	
Kd	Kd	0.72	mg/L	
Koc	Koc		mg/L	
Photolysis half-life	kdp	0	days	Half-life
Aerobic Aquatic Metabolism	kbacw	500	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	504	days	Halfife
Aerobic Soil Metabolism	asm	250	days	Halfife
Hydrolysis:	pH 7	161	days	Half-life
Method:	CAM	2	integer	See PRZM manual
Incorporation Depth:	DEPI	0.1	cm	
Application Rate:	TAPP	.107	kg/ha	
Application Efficiency:	APPEFF	1.0	fraction	
Spray Drift	DRFT	0.0	fraction of application rate applied to pond	
Application Date	Date	07-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	14	days	Set to 0 or delete line for single app.
Interval 2	interval	14	days	Set to 0 or delete line for single app.
Interval 3	interval	14	days	Set to 0 or delete line for single app.
Interval 4	interval	14	days	Set to 0 or delete line for single app.
Interval 5	interval	14	days	Set to 0 or delete line for single app.
Record 17:FILTRA				
	IPSCND	1		
	UPTKF			
Record 18:PLVKRT				
	PLDKRT			
	FEXTRC			
Flag for Index Res. Run	IR	IR		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

## Turf Application in FL at 1.3 lb ai/acre applied six times (aerobic half-life 107 days)

stored as triazoleFLturf107new.out

Chemical: triazole

PRZM environment: FLturfC.txt modified Monday, 24 November 2003 at 14:49:10

EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12

Metfile: w12834.dvf modified Wedday, 3 July 2002 at 10:04:28

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
1961	0	0	0	0	0	0		
1962	1.113e-006		1.089e-006		9.908e-007	8.033e-007	6.915e-007	2.416e-
007								
1963	0.09305	0.09143	0.08665	0.07312	0.0641	0.02484		
1964	0.02291	0.02247	0.02085	0.01751	0.01538	0.006095		
1965	1.109	1.087	0.6453	0.2287	0.1546	0.06721		
1966	0.9747	0.956	0.8819	0.7391	0.6498	0.258		
1967	0.02217	0.02176	0.02014	0.01863	0.01726	0.007324		
1968	0.001457	0.001429	0.0006717	0.0005725	0.0005104	0.0002241		
1969	0.003032	0.002974	0.002746	0.002302	0.002016	0.0008966		
1970	1.079	1.06	0.9823	0.8252	0.7254	0.2842		
1971	0.4615	0.4525	0.419	0.351	0.3077	0.1211		
1972	1.321	1.295	0.6551	0.2296	0.1533	0.04149		
1973	1.182	1.159	1.068	0.895	0.7861	0.3099		
1974	5.439	5.333	4.053	1.419	0.9467	0.2409		

1975	4.597	4.505	4.142	3.447	3.019	1.186
1976	0.09857	0.09683	0.08988	0.07617	0.06727	0.02788
1977	0.5328	0.5229	0.4834	0.4067	0.3573	0.1403
1978	4.964	4.862	1.728	0.6052	0.4036	0.1027
1979	4.762	4.68	4.32	3.623	3.185	1.256
1980	3.653	3.583	1.66	0.5846	0.3923	0.1348
1981	8.267	8.127	3.011	2.617	2.344	1.056
1982	7.951	7.798	7.195	6.02	5.277	2.082
1983	3.265	3.202	1.95	0.7033	0.5139	0.3226
1984	2.909	2.854	2.635	2.212	1.946	0.774
1985	0.06514	0.064	0.05943	0.0504	0.04784	0.02509
1986	1.693	1.666	1.537	1.285	1.127	0.4455
1987	0.9272	0.9095	0.8395	0.7057	0.6208	0.2465
1988	0.03593	0.03527	0.03266	0.02761	0.02474	0.01074
1989	11.36	11.13	10.23	8.516	7.445	2.886
1990	0.4157	0.4078	0.3764	0.3153	0.277	0.11

#### Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	11.36	11.13	10.23	8.516	7.445	2.886
0.0645161290322581	8.267	8.127	7.195	6.02	5.277	2.082
0.0967741935483871	7.951	7.798	4.32	3.623	3.185	1.256
0.129032258064516	5.439	5.333	4.142	3.447	3.019	1.186
0.161290322580645	4.964	4.862	4.053	2.617	2.344	1.056
0.193548387096774	4.762	4.68	3.011	2.212	1.946	0.774
0.225806451612903	4.597	4.505	2.635	1.419	1.127	0.4455
0.258064516129032	3.653	3.583	1.95	1.285	0.9467	0.3226
0.290322580645161	3.265	3.202	1.728	0.895	0.7861	0.3099
0.32258064516129	2.909	2.854	1.66	0.8252	0.7254	0.2842
0.354838709677419	1.693	1.666	1.537	0.7391	0.6498	0.258
0.387096774193548	1.321	1.295	1.068	0.7057	0.6208	0.2465
0.419354838709677	1.182	1.159	0.9823	0.7033	0.5139	0.2409
0.451612903225806	1.109	1.087	0.8819	0.6052	0.4036	0.1403
0.483870967741936	1.079	1.06	0.8395	0.5846	0.3923	0.1348
0.516129032258065	0.9747	0.956	0.6551	0.4067	0.3573	0.1211
0.548387096774194	0.9272	0.9095	0.6453	0.351	0.3077	0.11
0.580645161290323	0.5328	0.5229	0.4834	0.3153	0.277	0.1027
0.612903225806452	0.4615	0.4525	0.419	0.2296	0.1546	0.06721
0.645161290322581	0.4157	0.4078	0.3764	0.2287	0.1533	0.04149
0.67741935483871	0.09857	0.09683	0.08988	0.07617	0.06727	0.02788
0.709677419354839	0.09305	0.09143	0.08665	0.07312	0.0641	0.02509
0.741935483870968	0.06514	0.064	0.05943	0.0504	0.04784	0.02484
0.774193548387097	0.03593	0.03527	0.03266	0.02761	0.02474	0.01074
0.806451612903226	0.02291	0.02247	0.02085	0.01863	0.01726	0.007324
0.838709677419355	0.02217	0.02176	0.02014	0.01751	0.01538	0.006095
0.870967741935484	0.003032	0.002974	0.002746	0.002302	0.002016	0.0008966
0.903225806451613	0.001457	0.001429	0.0006717	0.0005725	0.0005104	0.0002241
0.935483870967742	1.113e-006		1.089e-006		9.908e-007	8.033e-007
						6.915e-007
			2.416e-007			
0.967741935483871	0	0	0	0	0	0
0.1	7.6998	7.5515	4.3022	3.6054	3.1684	1.249
			Average of yearly averages:			0.40560966472

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazoleFLturf107new

Metfile: w12834.dvf

PRZM scenario: FLturfC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	69.07	g/mol	
Henry's Law Const.	henry	1.97e-10	atm-m^3/mol	
Vapor Pressure	vapr	1.65e-3	torr	
Solubility sol	7.0e+6	mg/L		
Kd	Kd	0.72	mg/L	
Koc	Koc	mg/L		
Photolysis half-life	kdp	0	days	Half-life

Aerobic Aquatic Metabolism kbacw 214 days Halfife  
 Anaerobic Aquatic Metabolism kbacs 504 days Halfife  
 Aerobic Soil Metabolism asm 107 days Halfife  
 Hydrolysis: pH 7 161 days Half-life  
 Method: CAM 2 integer See PRZM manual  
 Incorporation Depth: DEPI 0.1 cm  
 Application Rate: TAPP .107 kg/ha  
 Application Efficiency: APPEFF 1.0 fraction  
 Spray Drift DRFT 0.0 fraction of application rate applied to pond  
 Application Date Date 07-06 dd/mm or dd/mmm or dd-mm or dd-mmm  
 Interval 1 interval 14 days Set to 0 or delete line for single app.  
 Interval 2 interval 14 days Set to 0 or delete line for single app.  
 Interval 3 interval 14 days Set to 0 or delete line for single app.  
 Interval 4 interval 14 days Set to 0 or delete line for single app.  
 Interval 5 interval 14 days Set to 0 or delete line for single app.  
 Record 17: FILTRA  
     IPSCND 1  
     UPTKF  
 Record 18: PLVKRT  
     PLDKRT  
     FEXTRC  
 Flag for Index Res. Run IR  
 Flag for runoff calc. RUNOFF total none, monthly or total(average of entire run)

### Turf Application in FL at 1.3 lb ai/acre applied six times (aerobic half-life 250 days)

stored as triazoleFLturf250new.out

Chemical: triazole

PRZM environment: FLturfC.txt modified Monday, 24 November 2003 at 14:49:10

EXAMS environment: ir298.exv modified Thursday, 29 August 2002 at 16:34:12

Metfile: w12834.dvf modified Wednesday, 3 July 2002 at 10:04:28

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly		
1961	0	0	0	0	0	0		
1962	2.088e-006		2.05e-006	1.894e-006		1.587e-006	1.397e-006	5.149e-007
1963	0.1068	0.1049	0.1001	0.08573	0.07614	0.03192		
1964	0.0268	0.02633	0.0246	0.02097	0.01864	0.008018		
1965	1.127	1.107	0.6607	0.2363	0.161	0.07546		
1966	1.003	0.9851	0.915	0.7783	0.6917	0.2951		
1967	0.03766	0.03703	0.03451	0.03153	0.02914	0.01315		
1968	0.001862	0.001831	0.001709	0.00147	0.001318	0.0005907		
1969	0.003588	0.003526	0.003276	0.002787	0.002473	0.001163		
1970	1.148	1.13	1.053	0.8968	0.7969	0.3372		
1971	0.5685	0.5584	0.5206	0.4434	0.3936	0.1679		
1972	1.35	1.326	0.6736	0.2368	0.1586	0.04733		
1973	1.222	1.2	1.114	0.948	0.8421	0.3579		
1974	5.444	5.348	4.088	1.433	0.9567	0.25		
1975	4.675	4.592	4.259	3.612	3.205	1.36		
1976	0.1713	0.1685	0.1572	0.1348	0.1203	0.05329		
1977	0.569	0.5592	0.5198	0.4428	0.3934	0.1668		
1978	5.158	5.065	1.796	0.6295	0.4202	0.1098		
1979	4.973	4.895	4.552	3.873	3.442	1.463		
1980	3.753	3.687	1.716	0.6093	0.4123	0.1679		
1981	8.679	8.547	3.139	2.776	2.519	1.214		
1982	8.383	8.236	7.652	6.505	5.773	2.455		
1983	3.323	3.265	2.004	0.7557	0.6735	0.4139		
1984	2.993	2.941	2.733	2.327	2.069	0.8822		
1985	0.1113	0.1095	0.1022	0.08765	0.08295	0.0455		
1986	1.848	1.821	1.693	1.438	1.276	0.5429		
1987	1.012	0.9944	0.924	0.7882	0.701	0.2992		
1988	0.05296	0.05207	0.04859	0.04167	0.039	0.01791		
1989	13	12.77	11.84	10.04	8.895	3.73		
1990	0.6894	0.6776	0.6307	0.5381	0.4791	0.2058		

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
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0.032258064516129	13	12.77	11.84	10.04	8.895	3.73
0.0645161290322581	8.679	8.547	7.652	6.505	5.773	2.455
0.0967741935483871	8.383	8.236	4.552	3.873	3.442	1.463
0.129032258064516	5.444	5.348	4.259	3.612	3.205	1.36
0.161290322580645	5.158	5.065	4.088	2.776	2.519	1.214
0.193548387096774	4.973	4.895	3.139	2.327	2.069	0.8822
0.225806451612903	4.675	4.592	2.733	1.438	1.276	0.5429
0.258064516129032	3.753	3.687	2.004	1.433	0.9567	0.4139
0.290322580645161	3.323	3.265	1.796	0.948	0.8421	0.3579
0.32258064516129	2.993	2.941	1.716	0.8968	0.7969	0.3372
0.354838709677419	1.848	1.821	1.693	0.7882	0.701	0.2992
0.387096774193548	1.35	1.326	1.114	0.7783	0.6917	0.2951
0.419354838709677	1.222	1.2	1.053	0.7557	0.6735	0.25
0.451612903225806	1.148	1.13	0.924	0.6295	0.4791	0.2058
0.483870967741936	1.127	1.107	0.915	0.6093	0.4202	0.1679
0.516129032258065	1.012	0.994	0.6736	0.5381	0.4123	0.1679
0.548387096774194	1.003	0.9851	0.6607	0.4434	0.3936	0.1668
0.580645161290323	0.6894	0.6776	0.6307	0.4428	0.3934	0.1098
0.612903225806452	0.569	0.5592	0.5206	0.2368	0.161	0.07546
0.645161290322581	0.5685	0.5584	0.5198	0.2363	0.1586	0.05329
0.67741935483871	0.1713	0.1685	0.1572	0.1348	0.1203	0.04733
0.709677419354839	0.1113	0.1095	0.1022	0.08765	0.08295	0.0455
0.741935483870968	0.1068	0.1049	0.1001	0.08573	0.07614	0.03192
0.774193548387097	0.05296	0.05207	0.04859	0.04167	0.039	0.01791
0.806451612903226	0.03766	0.03703	0.03451	0.03153	0.02914	0.01315
0.838709677419355	0.0268	0.02633	0.0246	0.02097	0.01864	0.008018
0.870967741935484	0.003588	0.003526	0.003276	0.002787	0.002473	0.001163
0.903225806451613	0.001862	0.001831	0.001709	0.00147	0.001318	0.0005907
0.935483870967742	2.088e-006		2.05e-006	1.894e-006	1.587e-006	1.397e-006
007						5.149e-
0.967741935483871	0	0	0	0	0	0
0.1	8.0891	7.9472	4.5227	3.8469	3.4183	1.4527
Average of yearly averages: 0.49043107383						

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazoleFLturf250new

Metfile: w12834.dvf

PRZM scenario: FLturfC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	69.07	g/mol	
Henry's Law Const.	henry	1.97e-10	atm-m^3/mol	
Vapor Pressure	vapr	1.65e-3	torr	
Solubility sol	7.0e+6	mg/L		
Kd	Kd	0.72	mg/L	
Koc	Koc		mg/L	
Photolysis half-life	kdp	0	days	Half-life
Aerobic Aquatic Metabolism	kbacw	500	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	504	days	Halfife
Aerobic Soil Metabolism	asm	250	days	Halfife
Hydrolysis:	pH 7	161	days	Half-life
Method:	CAM	2	integer	See PRZM manual
Incorporation Depth:	DEPI	0.1	cm	
Application Rate:	TAPP	.107	kg/ha	
Application Efficiency:	APPEFF	1.0	fraction	
Spray Drift	DRFT	0.0	fraction of application rate applied to pond	
Application Date	Date	07-06	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1 interval	14	days	Set to 0 or delete line for single app.	
Interval 2 interval	14	days	Set to 0 or delete line for single app.	
Interval 3 interval	14	days	Set to 0 or delete line for single app.	
Interval 4 interval	14	days	Set to 0 or delete line for single app.	
Interval 5 interval	14	days	Set to 0 or delete line for single app.	

Record 17:FILTRA

IPSCND 1

UPTKF

Record 18:PLVKRT

PLDKRT

FEXTRC

Flag for Index Res. Run	IR	IR
Flag for runoff calc.	RUNOFF	total

none, monthly or total(average of entire run)

## Application to Apples in PA at 0.25 lb ai/acre applied 8 times annually (Aerobic half-life 107 days)

stored as triazolePAples output 107.txt

Chemical: triazole

PRZM environment: PAappleC.txt modified Monday, 24 November 2003 at 14:49:49

EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12

Metfile: w14737.dvf modified Wedday, 3 July 2002 at 10:06:12

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.157	0.1541	0.143	0.1019	0.07789	0.03248
1962	3.358	3.298	3.187	2.73	1.882	0.5204
1963	3.731	3.685	3.419	2.759	1.886	1.057
1964	2.299	2.259	2.1	1.79	1.593	0.7743
1965	0.7721	0.7587	0.7053	0.6011	0.5351	0.2291
1966	3.077	3.02	2.794	2.386	1.86	0.4718
1967	2.006	1.971	1.831	1.607	1.284	0.9556
1968	1.198	1.177	1.096	0.9362	0.8343	0.4947
1969	0.3787	0.3723	0.3466	0.2962	0.2642	0.1325
1970	9.669	9.502	8.892	7.822	6.35	1.582
1971	5.252	5.165	4.817	4.131	3.692	2.195
1972	2.662	2.615	2.445	2.165	1.842	1.344
1973	5.73	5.625	5.226	4.479	3.209	1.336
1974	4.233	4.156	3.849	3.282	2.68	1.691
1975	6.734	6.606	6.1	5.189	4.121	1.674
1976	5.977	5.871	5.616	4.836	3.785	1.911
1977	3.602	3.538	3.283	3.11	2.565	1.608
1978	2.224	2.186	2.035	1.739	1.551	0.7305
1979	0.4279	0.4202	0.3904	0.3297	0.2956	0.1519
1980	3.47	3.404	3.151	2.684	1.974	0.5477
1981	1.91	1.877	1.747	1.491	1.327	0.8374
1982	2.139	2.101	1.966	1.686	1.312	0.65
1983	2.685	2.64	2.456	2.092	1.61	0.7912
1984	7.616	7.469	6.939	5.893	4.533	1.764
1985	4.057	3.989	3.713	3.174	2.829	1.406
1986	0.6523	0.6413	0.5984	0.5104	0.455	0.3526
1987	1.88	1.846	1.712	1.529	1.117	0.4086
1988	2.747	2.698	2.504	2.2	1.717	0.7955
1989	3.265	3.203	2.962	2.522	2.016	1.079
1990	1.696	1.667	1.55	1.321	1.175	0.6615

### Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	9.669	9.502	8.892	7.822	6.35	2.195
0.0645161290322581	7.616	7.469	6.939	5.893	4.533	1.911
0.0967741935483871	6.734	6.606	6.1	5.189	4.121	1.764
0.129032258064516	5.977	5.871	5.616	4.836	3.785	1.691
0.161290322580645	5.73	5.625	5.226	4.479	3.692	1.674
0.193548387096774	5.252	5.165	4.817	4.131	3.209	1.608
0.225806451612903	4.233	4.156	3.849	3.282	2.829	1.582
0.258064516129032	4.057	3.989	3.713	3.174	2.68	1.406
0.290322580645161	3.731	3.685	3.419	3.11	2.565	1.344
0.32258064516129	3.602	3.538	3.283	2.759	2.016	1.336
0.354838709677419	3.47	3.404	3.187	2.73	1.974	1.079
0.387096774193548	3.358	3.298	3.151	2.684	1.886	1.057
0.419354838709677	3.265	3.203	2.962	2.522	1.882	0.9556
0.451612903225806	3.077	3.02	2.794	2.386	1.86	0.8374
0.483870967741936	2.747	2.698	2.504	2.2	1.842	0.7955
0.516129032258065	2.685	2.64	2.456	2.165	1.717	0.7912
0.548387096774194	2.662	2.615	2.445	2.092	1.61	0.7743

0.580645161290323	2.299	2.259	2.1	1.79	1.593	0.7305
0.612903225806452	2.224	2.186	2.035	1.739	1.551	0.6615
0.645161290322581	2.139	2.101	1.966	1.686	1.327	0.65
0.67741935483871	2.006	1.971	1.831	1.607	1.312	0.5477
0.709677419354839	1.91	1.877	1.747	1.529	1.284	0.5204
0.741935483870968	1.88	1.846	1.712	1.491	1.175	0.4947
0.774193548387097	1.696	1.667	1.55	1.321	1.117	0.4718
0.806451612903226	1.198	1.177	1.096	0.9362	0.8343	0.4086
0.838709677419355	0.7721	0.7587	0.7053	0.6011	0.5351	0.3526
0.870967741935484	0.6523	0.6413	0.5984	0.5104	0.455	0.2291
0.903225806451613	0.4279	0.4202	0.3904	0.3297	0.2956	0.1519
0.935483870967742	0.3787	0.3723	0.3466	0.2962	0.2642	0.1325
0.967741935483871	0.157	0.1541	0.143	0.1019	0.07789	0.03248
0.1	6.6583	6.5325	6.0516	5.1537	4.0874	1.7567

Average of yearly averages: 0.939492666666666

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazolePAapples

Metfile: w14737.dvf

PRZM scenario: PAappleC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	69.07	g/mol	
Henry's Law Const.	henry	1.97e-10	atm-m^3/mol	
Vapor Pressure	vapr	1.65e-3	torr	
Solubility sol	7.0e+6	mg/L		
Kd	Kd	0.72	mg/L	
Koc	Koc		mg/L	
Photolysis half-life	kdp	0	days	Half-life
Aerobic Aquatic Metabolism	kbacw	214	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	504	days	Halfife
Aerobic Soil Metabolism	asm	107	days	Halfife
Hydrolysis:	pH 7	161	days	Half-life
Method:	CAM	2	integer	See PRZM manual
Incorporation Depth:	DEPI	0.1	cm	
Application Rate:	TAPP	0.02	kg/ha	
Application Efficiency:	APPEFF	1.0	fraction	
Spray Drift	DRFT	0.0		fraction of application rate applied to pond
Application Date	Date	01-05		dd/mm or dd/mmm or dd-mm or dd-mmm
Interval 1 interval	7	days		Set to 0 or delete line for single app.
Interval 2 interval	7	days		Set to 0 or delete line for single app.
Interval 3 interval	7	days		Set to 0 or delete line for single app.
Interval 4 interval	7	days		Set to 0 or delete line for single app.
Interval 5 interval	7	days		Set to 0 or delete line for single app.
Interval 6 interval	7	days		Set to 0 or delete line for single app.
Interval 7 interval	7	days		Set to 0 or delete line for single app.
Record 17:FILTRA				
IPSCND	1			
UPTKF				
Record 18:PLVKRT				
PLDKRT				
FEXTRC				
Flag for Index Res. Run	IR			
Flag for runoff calc.	RUNOFF	total		none, monthly or total(average of entire run)

## Application to Apples in PA at 0.25 lb ai/acre applied 8 times annually (Aerobic half-life 250 days)

stored as triazolePAapples.out

Chemical: triazole

PRZM environment: PAappleC.txt modified Monday, 24 November 2003 at 14:49:49

EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12

Metfile: w14737.dvf modified Wedday, 3 July 2002 at 10:06:12  
 Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.1821	0.179	0.1667	0.1197	0.09264	0.03853
1962	3.586	3.525	3.408	2.939	2.029	0.5672
1963	4.082	4.034	3.76	3.058	2.104	1.194
1964	2.575	2.532	2.36	2.023	1.808	0.916
1965	0.9323	0.9168	0.8545	0.7324	0.6547	0.2925
1966	3.127	3.073	2.857	2.464	1.927	0.4948
1967	2.18	2.144	1.998	1.762	1.425	1.059
1968	1.331	1.309	1.222	1.05	0.9394	0.5694
1969	0.4308	0.4238	0.3956	0.34	0.3044	0.1584
1970	9.757	9.604	8.991	7.991	6.509	1.626
1971	5.477	5.39	5.039	4.345	3.898	2.401
1972	2.926	2.878	2.689	2.39	2.065	1.529
1973	6.104	6.003	5.602	4.844	3.491	1.497
1974	4.364	4.29	3.994	3.437	2.831	1.881
1975	6.868	6.749	6.273	5.392	4.304	1.797
1976	6.175	6.073	5.838	5.064	3.987	2.073
1977	3.793	3.73	3.476	3.277	2.724	1.765
1978	2.395	2.356	2.199	1.89	1.692	0.8332
1979	0.4572	0.45	0.4215	0.3639	0.332	0.1834
1980	3.608	3.545	3.298	2.833	2.089	0.5883
1981	2.047	2.013	1.878	1.612	1.442	0.9418
1982	2.315	2.276	2.14	1.844	1.449	0.7345
1983	2.797	2.752	2.575	2.212	1.713	0.8805
1984	7.898	7.76	7.256	6.218	4.81	1.905
1985	4.365	4.294	4.008	3.445	3.084	1.596
1986	0.7727	0.7601	0.7096	0.6099	0.546	0.4228
1987	2.017	1.982	1.847	1.65	1.211	0.458
1988	2.855	2.808	2.618	2.326	1.828	0.8785
1989	3.377	3.318	3.085	2.65	2.134	1.177
1990	1.816	1.786	1.665	1.429	1.277	0.7511

#### Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	9.757	9.604	8.991	7.991	6.509	2.401
0.0645161290322581	7.898	7.76	7.256	6.218	4.81	2.073
0.0967741935483871	6.868	6.749	6.273	5.392	4.304	1.905
0.129032258064516	6.175	6.073	5.838	5.064	3.987	1.881
0.161290322580645	6.104	6.003	5.602	4.844	3.898	1.797
0.193548387096774	5.477	5.39	5.039	4.345	3.491	1.765
0.225806451612903	4.365	4.294	4.008	3.445	3.084	1.626
0.258064516129032	4.364	4.29	3.994	3.437	2.831	1.596
0.290322580645161	4.082	4.034	3.76	3.277	2.724	1.529
0.32258064516129	3.793	3.73	3.476	3.058	2.134	1.497
0.354838709677419	3.608	3.545	3.408	2.939	2.104	1.194
0.387096774193548	3.586	3.525	3.298	2.833	2.089	1.177
0.419354838709677	3.377	3.318	3.085	2.65	2.065	1.059
0.451612903225806	3.127	3.073	2.857	2.464	2.029	0.9418
0.483870967741936	2.926	2.878	2.689	2.39	1.927	0.916
0.516129032258065	2.855	2.808	2.618	2.326	1.828	0.8805
0.548387096774194	2.797	2.752	2.575	2.212	1.808	0.8785
0.580645161290323	2.575	2.532	2.36	2.023	1.713	0.8332
0.612903225806452	2.395	2.356	2.199	1.89	1.692	0.7511
0.645161290322581	2.315	2.276	2.14	1.844	1.449	0.7345
0.67741935483871	2.18	2.144	1.998	1.762	1.442	0.5883
0.709677419354839	2.047	2.013	1.878	1.65	1.425	0.5694
0.741935483870968	2.017	1.982	1.847	1.612	1.277	0.5672
0.774193548387097	1.816	1.786	1.665	1.429	1.211	0.4948
0.806451612903226	1.331	1.309	1.222	1.05	0.9394	0.458
0.838709677419355	0.9323	0.9168	0.8545	0.7324	0.6547	0.4228
0.870967741935484	0.7727	0.7601	0.7096	0.6099	0.546	0.2925
0.903225806451613	0.4572	0.45	0.4215	0.3639	0.332	0.1834
0.935483870967742	0.4308	0.4238	0.3956	0.34	0.3044	0.1584
0.967741935483871	0.1821	0.179	0.1667	0.1197	0.09264	0.03853

0.1      6.7987      6.6814      6.2295      5.3592      4.2723      1.9026  
 Average of yearly averages:      1.04029766666667

Inputs generated by pc4.pl - 8-August-2003

Data used for this run:

Output File: triazolePApplies

Metfile: w14737.dvf

PRZM scenario: PAappleC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	69.07	g/mol	
Henry's Law Const.	henry	1.97e-10	atm-m^3/mol	
Vapor Pressure	vapr	1.65e-3	torr	
Solubility sol	7.0e+6	mg/L		
Kd	Kd	0.72	mg/L	
Koc	Koc		mg/L	
Photolysis half-life	kdp	0	days	Half-life
Aerobic Aquatic Metabolism	kbacw	500	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	504	days	Halfife
Aerobic Soil Metabolism	asm	250	days	Halfife
Hydrolysis:	pH 7	161	days	Half-life
Method:	CAM	2	integer	See PRZM manual
Incorporation Depth:	DEPI	0.1	cm	
Application Rate:	TAPP	0.02	kg/ha	
Application Efficiency:	APPEFF	1.0	fraction	
Spray Drift	DRFT	0.0		fraction of application rate applied to pond
Application Date	Date	01-05		dd/mm or dd/mmm or dd-mm or dd-mmm
Interval 1 interval	7	days		Set to 0 or delete line for single app.
Interval 2 interval	7	days		Set to 0 or delete line for single app.
Interval 3 interval	7	days		Set to 0 or delete line for single app.
Interval 4 interval	7	days		Set to 0 or delete line for single app.
Interval 5 interval	7	days		Set to 0 or delete line for single app.
Interval 6 interval	7	days		Set to 0 or delete line for single app.
Interval 7 interval	7	days		Set to 0 or delete line for single app.

Record 17:FILTRA

IPSCND 1

UPTKF

Record 18:PLVKRT

PLDKRT

FEXTRC

Flag for Index Res. Run

IR

Flag for runoff calc.

RUNOFF total none, monthly or total(average of entire run)

## Application to Apples in NC at 0.25 lb ai/acre applied 8 times annually (Aerobic half-life 107 days)

stored as triazoleNCapples.out

Chemical: triazole

PRZM environment: NCappleC.txt modified Monday, 24 November 2003 at 14:49:39

EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12

Metfile: w03812.dvf modified Wedday, 3 July 2002 at 10:05:50

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1965	0.2879	0.2812	0.2615	0.2266	0.2041	0.07589
1966	6.678	6.538	6.122	5.29	3.887	1.077
1967	5.511	5.397	4.944	4.245	3.165	1.749
1968	2.942	2.883	2.649	2.205	1.93	0.8206
1969	1.939	1.899	1.757	1.591	1.086	0.3239
1970	20.24	19.89	18.31	15.14	10.59	2.936
1971	10.44	10.23	9.395	7.804	6.824	3.06
1972	5.808	5.681	5.507	4.795	3.482	1.362
1973	3.348	3.28	3.012	2.503	2.186	1.141
1974	1.064	1.042	0.9534	0.7881	0.6875	0.3675
1975	4.262	4.171	3.916	3.089	2.092	0.6698
1976	3.384	3.312	3.154	2.666	2.028	1.303

1977	26.85	26.26	24.51	20.52	14.98	4.18
1978	13.74	13.47	12.38	10.31	9.025	3.887
1979	6.778	6.633	6.141	5.093	3.444	1.463
1980	3.666	3.591	3.294	2.733	2.389	1.138
1981	2.218	2.17	1.983	1.64	1.213	0.4838
1982	4.49	4.395	4.141	3.625	2.676	0.9806
1983	2.49	2.44	2.241	1.862	1.628	0.7488
1984	1.511	1.48	1.377	1.106	0.7766	0.4208
1985	2.972	2.927	2.735	2.305	1.608	0.6485
1986	18.26	17.86	16.33	13.47	9.828	2.838
1987	8.911	8.731	8.023	6.67	5.833	2.907
1988	2.361	2.313	2.126	1.769	1.547	0.6342
1989	3.682	3.604	3.366	2.394	1.642	0.5661
1990	2.333	2.285	2.094	1.735	1.516	0.6857

#### Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.037037037037037	26.85	26.26	24.51	20.52	14.98	4.18
0.0740740740740741	20.24	19.89	18.31	15.14	10.59	3.887
0.1111111111111111	18.26	17.86	16.33	13.47	9.828	3.06
0.148148148148148	13.74	13.47	12.38	10.31	9.025	2.936
0.185185185185185	10.44	10.23	9.395	7.804	6.824	2.907
0.2222222222222222	8.911	8.731	8.023	6.67	5.833	2.838
0.259259259259259	6.778	6.633	6.141	5.29	3.887	1.749
0.296296296296296	6.678	6.538	6.122	5.093	3.482	1.463
0.3333333333333333	5.808	5.681	5.507	4.795	3.444	1.362
0.37037037037037	5.511	5.397	4.944	4.245	3.165	1.303
0.407407407407407	4.49	4.395	4.141	3.625	2.676	1.141
0.4444444444444444	4.262	4.171	3.916	3.089	2.389	1.138
0.481481481481481	3.682	3.604	3.366	2.733	2.186	1.077
0.518518518518518	3.666	3.591	3.294	2.666	2.092	0.9806
0.5555555555555556	3.384	3.312	3.154	2.503	2.028	0.8206
0.592592592592593	3.348	3.28	3.012	2.394	1.93	0.7488
0.6296296296296	2.972	2.927	2.735	2.305	1.642	0.6857
0.6666666666666667	2.942	2.883	2.649	2.205	1.628	0.6698
0.703703703703704	2.49	2.44	2.241	1.862	1.608	0.6485
0.740740740740741	2.361	2.313	2.126	1.769	1.547	0.6342
0.7777777777777778	2.333	2.285	2.094	1.735	1.516	0.5661
0.814814814814815	2.218	2.17	1.983	1.64	1.213	0.4838
0.851851851851852	1.939	1.899	1.757	1.591	1.086	0.4208
0.888888888888889	1.511	1.48	1.377	1.106	0.7766	0.3675
0.925925925925926	1.064	1.042	0.9534	0.7881	0.6875	0.3239
0.962962962962963	0.2879	0.2812	0.2615	0.2266	0.2041	0.07589
0.1	18.854	18.469	16.924	13.971	10.0566	3.3081

Average of yearly averages: 1.40258423076923

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazoleNCapples  
 Metfile: w03812.dvf  
 PRZM scenario: NCappleC.txt  
 EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	69.07	g/mol	
Henry's Law Const.	henry	1.97e-10	atm-m^3/mol	
Vapor Pressure	vapr	1.65e-3	torr	
Solubility	sol	7.0e+6	mg/L	
Kd	Kd	0.72	mg/L	
Koc	Koc		mg/L	
Photolysis half-life	kdp	0	days	Half-life
Aerobic Aquatic Metabolism	kbacw	214	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	504	days	Halfife
Aerobic Soil Metabolism	asm	107	days	Halfife
Hydrolysis:	pH 7	161	days	Half-life
Method:	CAM	2	integer	See PRZM manual
Incorporation Depth:	DEPI	0.1	cm	
Application Rate:	TAPP	0.02	kg/ha	

Application Efficiency:	APPEFF	1.0	fraction
Spray Drift	DRFT	0.0	fraction of application rate applied to pond
Application Date	Date	01-05	dd/mm or dd/mmm or dd-mm or dd-mmm
Interval 1 interval	7	days	Set to 0 or delete line for single app.
Interval 2 interval	7	days	Set to 0 or delete line for single app.
Interval 3 interval	7	days	Set to 0 or delete line for single app.
Interval 4 interval	7	days	Set to 0 or delete line for single app.
Interval 5 interval	7	days	Set to 0 or delete line for single app.
Interval 6 interval	7	days	Set to 0 or delete line for single app.
Interval 7 interval	7	days	Set to 0 or delete line for single app.
Record 17:FILTRA			
	IPSCND	1	
	UPTKF		
Record 18:PLVKRT			
	PLDKRT		
	FEXTRC		
Flag for Index Res. Run	IR	IR	
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)

### Application to Apples in NC at 0.25 lb ai/acre applied 8 times annually (Aerobic half-life 250 days)

stored as triazoleNCapples output 250.txt

Chemical: triazole

PRZM environment: NCappleC.txt modified Monday, 24 November 2003 at 14:49:39

EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12

Metfile: w03812.dvf modified Wedday, 3 July 2002 at 10:05:50

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1965	0.3001	0.2938	0.2751	0.2392	0.2186	0.08454
1966	6.763	6.628	6.202	5.409	3.986	1.121
1967	5.632	5.52	5.077	4.382	3.287	1.867
1968	3.096	3.036	2.798	2.342	2.059	0.9113
1969	1.998	1.958	1.82	1.675	1.146	0.3522
1970	20.6	20.26	18.74	15.64	10.95	3.069
1971	10.98	10.77	9.92	8.295	7.289	3.38
1972	5.923	5.804	5.647	4.97	3.627	1.474
1973	3.545	3.476	3.202	2.678	2.353	1.28
1974	1.233	1.208	1.111	0.927	0.8137	0.4412
1975	4.506	4.416	4.154	3.301	2.243	0.7299
1976	3.476	3.406	3.248	2.77	2.128	1.427
1977	26.9	26.35	24.74	20.93	15.32	4.317
1978	14.29	14.01	12.92	10.81	9.51	4.271
1979	7.002	6.861	6.385	5.346	3.633	1.635
1980	3.914	3.837	3.532	2.951	2.592	1.281
1981	2.25	2.204	2.025	1.691	1.258	0.5238
1982	4.574	4.483	4.214	3.73	2.766	1.035
1983	2.62	2.569	2.367	1.98	1.74	0.8326
1984	1.623	1.59	1.487	1.209	0.8565	0.4781
1985	3.056	3.014	2.831	2.414	1.691	0.7101
1986	18.31	17.94	16.5	13.76	10.06	2.945
1987	9.288	9.108	8.393	7.023	6.172	3.204
1988	2.657	2.606	2.402	2.01	1.766	0.7516
1989	3.979	3.899	3.659	2.616	1.8	0.6272
1990	2.571	2.52	2.319	1.936	1.7	0.8004

#### Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.037037037037037	26.9	26.35	24.74	20.93	15.32	4.317
0.0740740740740741	20.6	20.26	18.74	15.64	10.95	4.271
0.111111111111111	18.31	17.94	16.5	13.76	10.06	3.38
0.148148148148148	14.29	14.01	12.92	10.81	9.51	3.204
0.185185185185185	10.98	10.77	9.92	8.295	7.289	3.069
0.222222222222222	9.288	9.108	8.393	7.023	6.172	2.945
0.259259259259259	7.002	6.861	6.385	5.409	3.986	1.867

0.296296296296296	6.763	6.628	6.202	5.346	3.633	1.635
0.333333333333333	5.923	5.804	5.647	4.97	3.627	1.474
0.37037037037037	5.632	5.52	5.077	4.382	3.287	1.427
0.407407407407407	4.574	4.483	4.214	3.73	2.766	1.281
0.444444444444444	4.506	4.416	4.154	3.301	2.592	1.28
0.481481481481481	3.979	3.899	3.659	2.951	2.353	1.121
0.518518518518	3.914	3.837	3.532	2.77	2.243	1.035
0.555555555555556	3.545	3.476	3.248	2.678	2.128	0.9113
0.592592592592593	3.476	3.406	3.202	2.616	2.059	0.8326
0.6296296296296293	3.096	3.036	2.831	2.414	1.8	0.8004
0.6666666666666667	3.056	3.014	2.798	2.342	1.766	0.7516
0.703703703703704	2.657	2.606	2.402	2.01	1.74	0.7299
0.740740740740741	2.62	2.569	2.367	1.98	1.7	0.7101
0.777777777777778	2.571	2.52	2.319	1.936	1.691	0.6272
0.814814814814815	2.25	2.204	2.025	1.691	1.258	0.5238
0.851851851851852	1.998	1.958	1.82	1.675	1.146	0.4781
0.888888888888889	1.623	1.59	1.487	1.209	0.8565	0.4412
0.925925925925926	1.233	1.208	1.111	0.927	0.8137	0.3522
0.962962962962963	0.3001	0.2938	0.2751	0.2392	0.2186	0.08454
0.1	18.997	18.636	17.172	14.324	10.327	3.6473

Average of yearly averages: 1.52111307692308

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazoleNCapples

Metfile: w03812.dvf

PRZM scenario: NCappleC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable Name	Value	Units	Comments
Molecular weight	mwt	69.07	g/mol	
Henry's Law Const.	henry	1.97e-10	atm-m^3/mol	
Vapor Pressure	vapr	1.65e-3	torr	
Solubility	sol	7.0e+6	mg/L	
Kd	Kd	0.72	mg/L	
Koc	Koc		mg/L	
Photolysis half-life	kdp	0	days	Half-life
Aerobic Aquatic Metabolism	kbacw	500	days	Halfife
Anaerobic Aquatic Metabolism	kbacs	504	days	Halfife
Aerobic Soil Metabolism	asm	250	days	Halfife
Hydrolysis:	pH 7	161	days	Half-life
Method:	CAM	2	integer	See PRZM manual
Incorporation Depth:	DEPI	0.1	cm	
Application Rate:	TAPP	0.02	kg/ha	
Application Efficiency:	APPEFF	1.0	fraction	
Spray Drift	DRFT	0.0	fraction of application rate applied to pond	
Application Date	Date	01-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1	interval	7	days	Set to 0 or delete line for single app.
Interval 2,	interval	7	days	Set to 0 or delete line for single app.
Interval 3	interval	7	days	Set to 0 or delete line for single app.
Interval 4	interval	7	days	Set to 0 or delete line for single app.
Interval 5	interval	7	days	Set to 0 or delete line for single app.
Interval 6	interval	7	days	Set to 0 or delete line for single app.
Interval 7	interval	7	days	Set to 0 or delete line for single app.
Record 17:FILTRA			Set to 0 or delete line for single app.	
IPSCND	1			
UPTKF				
Record 18:PLVKRT				
PLDKRT				
FEXTRC				
Flag for Index Res. Run	IR	IR		
Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	

**Application to Apples in PA at 1.0 lb ai/acre applied 2 times annually  
(Aerobic half-life 107 days)**

stored as triazolePAapples107new.out

Chemical: triazole

PRZM environment: PAappleC.txt modified Monday, 24 November 2003 at 14:49:49

EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12

Metfile: w14737.dvf modified Wedday, 3 July 2002 at 10:06:12

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.1218	0.1196	0.111	0.07604	0.05418	0.02196
1962	2.821	2.767	2.664	2.277	1.567	0.4282
1963	3.138	3.099	2.876	2.321	1.585	0.8825
1964	1.934	1.9	1.767	1.506	1.34	0.6535
1965	0.6495	0.6383	0.5933	0.5056	0.4501	0.1948
1966	2.586	2.538	2.348	2.006	1.563	0.3962
1967	1.603	1.575	1.463	1.28	1.003	0.7763
1968	0.9546	0.9382	0.873	0.7453	0.6638	0.3739
1969	0.3007	0.2955	0.275	0.2349	0.2093	0.09848
1970	8.138	7.998	7.484	6.584	5.345	1.333
1971	4.421	4.348	4.055	3.477	3.108	1.97
1972	2.275	2.236	2.081	1.778	1.586	1.107
1973	4.726	4.64	4.31	3.695	2.616	1.036
1974	3.623	3.557	3.295	2.809	2.302	1.507
1975	5.632	5.525	5.102	4.34	3.44	1.389
1976	5.029	4.94	4.726	4.069	3.185	1.609
1977	3.031	2.977	2.762	2.617	2.158	1.353
1978	1.871	1.839	1.712	1.463	1.305	0.7662
1979	0.6401	0.6277	0.5802	0.4801	0.4175	0.1994
1980	2.995	2.938	2.72	2.318	1.725	0.5651
1981	2.52	2.472	2.332	1.959	1.712	1.086
1982	1.945	1.91	1.786	1.541	1.237	0.7768
1983	2.246	2.208	2.055	1.75	1.343	0.6777
1984	6.534	6.408	5.953	5.056	3.917	1.7
1985	3.483	3.424	3.188	2.726	2.429	1.496
1986	1.147	1.124	1.037	0.8643	0.7542	0.486
1987	1.57	1.542	1.43	1.276	0.9284	0.3529
1988	2.305	2.264	2.101	1.846	1.439	0.6757
1989	2.883	2.828	2.617	2.228	1.805	1.107
1990	1.5	1.474	1.371	1.169	1.04	0.6398

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	8.138	7.998	7.484	6.584	5.345	1.97
0.0645161290322581	6.534	6.408	5.953	5.056	3.917	1.7
0.0967741935483871	5.632	5.525	5.102	4.34	3.44	1.609
0.129032258064516	5.029	4.94	4.726	4.069	3.185	1.507
0.161290322580645	4.726	4.64	4.31	3.695	3.108	1.496
0.193548387096774	4.421	4.348	4.055	3.477	2.616	1.389
0.225806451612903	3.623	3.557	3.295	2.809	2.429	1.353
0.258064516129032	3.483	3.424	3.188	2.726	2.302	1.333
0.290322580645161	3.138	3.099	2.876	2.617	2.158	1.107
0.32258064516129	3.031	2.977	2.762	2.321	1.805	1.107
0.354838709677419	2.995	2.938	2.72	2.318	1.725	1.086
0.387096774193548	2.883	2.828	2.664	2.277	1.712	1.036
0.419354838709677	2.821	2.767	2.617	2.228	1.586	0.8825
0.451612903225806	2.586	2.538	2.348	2.006	1.585	0.7768
0.483870967741936	2.52	2.472	2.332	1.959	1.567	0.7763
0.516129032258065	2.305	2.264	2.101	1.846	1.563	0.7662
0.548387096774194	2.275	2.236	2.081	1.778	1.439	0.6777
0.580645161290323	2.246	2.208	2.055	1.75	1.343	0.6757
0.612903225806452	1.945	1.91	1.786	1.541	1.34	0.6535
0.645161290322581	1.934	1.9	1.767	1.506	1.305	0.6398
0.67741935483871	1.871	1.839	1.712	1.463	1.237	0.5651
0.709677419354839	1.603	1.575	1.463	1.28	1.04	0.486
0.741935483870968	1.57	1.542	1.43	1.276	1.003	0.4282
0.774193548387097	1.5	1.474	1.371	1.169	0.9284	0.3962
0.806451612903226	1.147	1.124	1.037	0.8643	0.7542	0.3739
0.838709677419355	0.9546	0.9382	0.873	0.7453	0.6638	0.3529
0.870967741935484	0.6495	0.6383	0.5933	0.5056	0.4501	0.1994

0.903225806451613	0.6401	0.6277	0.5802	0.4801	0.4175	0.1948
0.935483870967742	0.3007	0.2955	0.275	0.2349	0.2093	0.09848
0.967741935483871	0.1218	0.1196	0.111	0.07604	0.05418	0.02196
0.1	5.5717	5.4665	5.0644	4.3129	3.4145	1.5988
Average of yearly averages:						0.855281333333334

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazolePAapples107new

Metfile: w14737.dvf

PRZM scenario: PAappleC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable Name	Value	Units	Comments
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Molecular weight	mwt	69.07	g/mol	
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Henry's Law Const.	henry	1.97e-10	atm-m^3/mol	
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Vapor Pressure	vapr	1.65e-3	torr	
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Solubility	sol	7.0e+6	mg/L	
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Kd	Kd	0.72	mg/L	
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Koc	Koc		mg/L	
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Photolysis half-life	kdp	0	days	Half-life
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Aerobic Aquatic Metabolism	kbacw	214	days	Halfife
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Anaerobic Aquatic Metabolism	kbacs	504	days	Halfife
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Aerobic Soil Metabolism	asm	107	days	Halfife
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Hydrolysis:	pH 7	161	days	Half-life
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Method:	CAM	2	integer	See PRZM manual
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Incorporation Depth:	DEPI	0.1	cm	
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Application Rate:	TAPP	.082	kg/ha	
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Application Efficiency:	APPEFF	1.0	fraction	
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Spray Drift	DRFT	0.0	fraction of application rate applied to pond	
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Application Date	Date	01-05	dd/mm or dd/mmm or dd-mm or dd-mmm	
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Interval 1 interval	7	days	Set to 0 or delete line for single app.	
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Record 17:FILTRA				
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IPSCND	1			
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UPTKf				
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Record 18:PLVKRT				
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PLDKRT				
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FEXTRC				
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Flag for Index Res. Run	IR			
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Flag for runoff calc.	RUNOFF	total	none, monthly or total(average of entire run)	
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## Application to Apples in PA at 1.0 lb ai/acre applied 2 times annually (Aerobic half-life 250 days)

stored as triazolePAapples250new.out

Chemical: triazole

PRZM environment: PAappleC.txt modified Monday, 24 November 2003 at 14:49:49

EXAMS environment: ir298.exv modified Thursday, 29 August 2002 at 16:34:12

Metfile: w14737.dvf modified Wednesday, 3 July 2002 at 10:06:12

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1961	0.14	0.1376	0.1281	0.0882	0.06346	0.0255
1962	3.029	2.977	2.877	2.482	1.71	0.473
1963	3.434	3.393	3.163	2.573	1.769	1.005
1964	2.166	2.13	1.986	1.702	1.521	0.7758
1965	0.7863	0.7732	0.7207	0.6176	0.552	0.2493
1966	2.627	2.582	2.401	2.07	1.618	0.4154
1967	1.735	1.706	1.59	1.398	1.109	0.857
1968	1.057	1.039	0.9696	0.8324	0.7446	0.4322
1969	0.3413	0.3356	0.3132	0.269	0.2407	0.1182
1970	8.212	8.083	7.568	6.726	5.478	1.369
1971	4.61	4.536	4.241	3.657	3.281	2.16
1972	2.528	2.487	2.321	1.994	1.784	1.267

1973	5.015	4.932	4.603	3.981	2.831	1.157
1974	3.748	3.684	3.43	2.952	2.441	1.673
1975	5.74	5.64	5.242	4.506	3.589	1.494
1976	5.196	5.11	4.913	4.261	3.354	1.744
1977	3.192	3.139	2.925	2.757	2.292	1.486
1978	2.015	1.982	1.85	1.59	1.424	0.8748
1979	0.7035	0.6913	0.6445	0.5455	0.4824	0.2462
1980	3.135	3.081	2.866	2.462	1.841	0.6177
1981	2.669	2.624	2.487	2.137	1.899	1.231
1982	2.155	2.119	1.99	1.728	1.409	0.9113
1983	2.342	2.304	2.155	1.852	1.431	0.7661
1984	6.808	6.69	6.255	5.361	4.181	1.845
1985	3.765	3.704	3.458	2.972	2.661	1.694
1986	1.274	1.251	1.166	0.9953	0.8835	0.5878
1987	1.685	1.657	1.543	1.378	1.007	0.4031
1988	2.396	2.356	2.197	1.952	1.532	0.7463
1989	3.011	2.959	2.753	2.365	1.933	1.212
1990	1.622	1.595	1.487	1.276	1.142	0.7328

#### Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.032258064516129	8.212	8.083	7.568	6.726	5.478	2.16
0.0645161290322581	6.808	6.69	6.255	5.361	4.181	1.845
0.0967741935483871	5.74	5.64	5.242	4.506	3.589	1.744
0.129032258064516	5.196	5.11	4.913	4.261	3.354	1.694
0.161290322580645	5.015	4.932	4.603	3.981	3.281	1.673
0.193548387096774	4.61	4.536	4.241	3.657	2.831	1.494
0.225806451612903	3.765	3.704	3.458	2.972	2.661	1.486
0.258064516129032	3.748	3.684	3.43	2.952	2.441	1.369
0.290322580645161	3.434	3.393	3.163	2.757	2.292	1.267
0.32258064516129	3.192	3.139	2.925	2.573	1.933	1.231
0.354838709677419	3.135	3.081	2.877	2.482	1.899	1.212
0.387096774193548	3.029	2.977	2.866	2.462	1.841	1.157
0.419354838709677	3.011	2.959	2.753	2.365	1.784	1.005
0.451612903225806	2.669	2.624	2.487	2.137	1.769	0.9113
0.483870967741936	2.627	2.582	2.401	2.07	1.71	0.8748
0.516129032258065	2.528	2.487	2.321	1.994	1.618	0.857
0.548387096774194	2.396	2.356	2.197	1.952	1.532	0.7758
0.580645161290323	2.342	2.304	2.155	1.852	1.521	0.7661
0.612903225806452	2.166	2.13	1.99	1.728	1.431	0.7463
0.645161290322581	2.155	2.119	1.986	1.702	1.424	0.7328
0.67741935483871	2.015	1.982	1.85	1.59	1.409	0.6177
0.709677419354839	1.735	1.706	1.59	1.398	1.142	0.5878
0.741935483870968	1.685	1.657	1.543	1.378	1.109	0.473
0.774193548387097	1.622	1.595	1.487	1.276	1.007	0.4322
0.806451612903226	1.274	1.251	1.166	0.9953	0.8835	0.4154
0.838709677419355	1.057	1.039	0.9696	0.8324	0.7446	0.4031
0.870967741935484	0.7863	0.7732	0.7207	0.6176	0.552	0.2493
0.903225806451613	0.7035	0.6913	0.6445	0.5455	0.4824	0.2462
0.935483870967742	0.3413	0.3356	0.3132	0.269	0.2407	0.1182
0.967741935483871	0.14	0.1376	0.1281	0.0882	0.06346	0.0255
0.1	5.6856	5.587	5.2091	4.4815	3.5655	1.739

Average of yearly averages: 0.952316666666667

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazolePAappleC250new

Metfile: w14737.dvf

PRZM scenario: PAappleC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable	Name	Value	Units	Comments
Molecular weight	mwt	69.07	g/mol		
Henry's Law Const.	henry	1.97e-10	atm-m^3/mol		
Vapor Pressure	vapr	1.65e-3	torr		
Solubility	sol	7.0e+6	mg/L		
Kd	Kd	0.72	mg/L		
Koc	Koc		mg/L		

Photolysis half-life	kdp	0	days	Half-life	
Aerobic Aquatic Metabolism	kbacw	500	days	Halfife	
Anaerobic Aquatic Metabolism	kbacs	504	days	Halfife	
Aerobic Soil Metabolism	asm	250	days	Halfife	
Hydrolysis:	pH-7	161	days	Half-life	
Method: CAM	2	integer		See PRZM manual	
Incorporation Depth: DEPI	0.1		cm		
Application Rate: TAPP	.082		kg/ha		
Application Efficiency:	APPEFF	1.0	fraction		
Spray Drift	DRFT	0.0		fraction of application rate applied to pond	
Application Date	Date	01-05		dd/mm or dd/mmm or dd-mm or dd-mmm	
Interval 1 interval	7	days		Set to 0 or delete line for single app.	
Record 17:FILTRA					
IPSCND	1				
UPTKF					
Record 18:PLVKRT					
PLDKRT					
FEXTRC					
Flag for Index Res. Run	IR	IR			
Flag for runoff calc.	RUNOFF	total		none, monthly or total(average of entire run)	

### Application to Apples in NC at 1.0 lb ai/acre applied 2 times annually (Aerobic half-life 107 days)

stored as triazoleNCapples107new.out

Chemical: triazole

PRZM environment: NCappleC.txt modified Monday, 24 November 2003 at 14:49:39

EXAMS environment: ir298.exv modified Thursday, 29 August 2002 at 16:34:12

Metfile: w03812.dvf modified Wednesday, 3 July 2002 at 10:05:50

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1965	0.3328	0.323	0.292	0.2374	0.2047	0.07254
1966	6.77	6.628	6.207	5.363	3.948	1.143
1967	5.527	5.412	4.958	4.256	3.161	1.73
1968	2.95	2.89	2.656	2.21	1.935	0.7839
1969	1.952	1.911	1.768	1.602	1.091	0.3238
1970	20.43	20.08	18.49	15.29	10.69	2.955
1971	10.54	10.33	9.484	7.878	6.889	3.091
1972	5.844	5.716	5.542	4.827	3.498	1.403
1973	3.37	3.302	3.032	2.52	2.201	1.273
1974	1.101	1.078	0.9869	0.816	0.712	0.414
1975	4.29	4.199	3.942	3.107	2.098	0.6661
1976	3.289	3.219	3.064	2.591	1.937	1.166
1977	27.09	26.5	24.73	20.71	15.12	4.195
1978	13.87	13.59	12.49	10.4	9.107	3.958
1979	6.822	6.676	6.181	5.126	3.457	1.457
1980	3.69	3.615	3.316	2.751	2.405	1.337
1981	2.204	2.156	1.97	1.63	1.196	0.467
1982	4.492	4.397	4.139	3.626	2.664	0.9409
1983	2.491	2.441	2.242	1.863	1.628	0.7343
1984	1.52	1.488	1.385	1.112	0.7778	0.4486
1985	2.995	2.95	2.757	2.323	1.618	0.6478
1986	18.45	18.05	16.5	13.61	9.931	2.868
1987	9.004	8.823	8.107	6.74	5.895	2.82
1988	2.328	2.281	2.097	1.744	1.525	0.6218
1989	3.685	3.607	3.37	2.389	1.624	0.5636
1990	2.335	2.287	2.096	1.737	1.517	0.745

Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.037037037037037	27.09	26.5	24.73	20.71	15.12	4.195
0.0740740740740741	20.43	20.08	18.49	15.29	10.69	3.958
0.1111111111111111	18.45	18.05	16.5	13.61	9.931	3.091
0.148148148148148	13.87	13.59	12.49	10.4	9.107	3.955

0.185185185185185	10.54	10.33	9.484	7.878	6.889	2.868
0.222222222222222	9.004	8.823	8.107	6.74	5.895	2.82
0.259259259259259	6.822	6.676	6.207	5.363	3.948	1.73
0.296296296296296	6.77	6.628	6.181	5.126	3.498	1.457
0.333333333333333	5.844	5.716	5.542	4.827	3.457	1.403
0.37037037037037	5.527	5.412	4.958	4.256	3.161	1.337
0.407407407407407	4.492	4.397	4.139	3.626	2.664	1.273
0.444444444444444	4.29	4.199	3.942	3.107	2.405	1.166
0.481481481481481	3.69	3.615	3.37	2.751	2.201	1.143
0.518518518518518	3.685	3.607	3.316	2.591	2.098	0.9409
0.5555555555555556	3.37	3.302	3.064	2.52	1.937	0.7839
0.592592592592593	3.289	3.219	3.032	2.389	1.935	0.745
0.6296296296296293	2.995	2.95	2.757	2.323	1.628	0.7343
0.6666666666666667	2.95	2.89	2.656	2.21	1.624	0.6661
0.703703703703704	2.491	2.441	2.242	1.863	1.618	0.6478
0.740740740740741	2.335	2.287	2.097	1.744	1.525	0.6218
0.7777777777777778	2.328	2.281	2.096	1.737	1.517	0.5636
0.814814814814815	2.204	2.156	1.97	1.63	1.196	0.467
0.851851851851852	1.952	1.911	1.768	1.602	1.091	0.4486
0.888888888888889	1.52	1.488	1.385	1.112	0.7778	0.414
0.925925925925926	1.101	1.078	0.9869	0.816	0.712	0.3238
0.962962962962963	0.3328	0.323	0.292	0.2374	0.2047	0.07254
0.1	19.044	18.659	17.097	14.114	10.1587	3.3511

Average of yearly averages: 1.41635923076923

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazoleNCapples107new

Metfile: w03812.dvf

PRZM scenario: NCappleC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable Name	Value	Units	Comments
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Molecular weight mwt 69.07 g/mol

Henry's Law Const. henry 1.97e-10 atm-m<sup>3</sup>/mol

Vapor Pressure vapr 1.65e-3 torr

Solubility sol 7.0e+6 mg/L

Kd Kd 0.72 mg/L

Koc Koc mg/L

Photolysis half-life kdp 0 days Half-life

Aerobic Aquatic Metabolism kbacw 214 days Halflife

Anaerobic Aquatic Metabolism kbacs 504 days Halflife

Aerobic Soil Metabolism asm 107 days Halflife

Hydrolysis: pH 7 161 days Half-life

Method: CAM 2 integer See PRZM manual

Incorporation Depth: DEPI 0.1 cm

Application Rate: TAPP 0.082 kg/ha

Application Efficiency: APPEFF 1.0 fraction

Spray Drift DRFT 0.0 fraction of application rate applied to pond

Application Date Date 01-05 dd/mm or dd/mmm or dd-mm or dd-mmm

Interval 1 interval 7 days Set to 0 or delete line for single app.

Record 17:FILTRA

IPSCND 1

UPTKF

Record 18:PLVKRT

PLDKRT

FEXTRC

Flag for Index Res. Run IR

Flag for runoff calc. RUNOFF total none, monthly or total(average of entire run)

## Application to Apples in NC at 1.0 lb ai/acre applied 2 times annually (Aerobic half-life 250 days)

stored as triazoleNCapples250new.out

Chemical: triazole

PRZM environment: NCappleC.txt

modified Monday, 24 November 2003 at 14:49:39

EXAMS environment: ir298.exv modified Thuday, 29 August 2002 at 16:34:12

Metfile: w03812.dvf modified Wedday, 3 July 2002 at 10:05:50

Water segment concentrations (ppb)

Year	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
1965	0.3512	0.3438	0.3148	0.2608	0.2282	0.08412
1966	6.863	6.726	6.296	5.49	4.055	1.195
1967	5.642	5.529	5.085	4.388	3.278	1.847
1968	3.101	3.041	2.802	2.345	2.062	0.8695
1969	2.01	1.97	1.831	1.686	1.151	0.3509
1970	20.79	20.45	18.91	15.78	11.05	3.085
1971	11.08	10.87	10.01	8.37	7.356	3.415
1972	5.962	5.843	5.683	5.003	3.644	1.518
1973	3.569	3.499	3.224	2.696	2.368	1.425
1974	1.28	1.255	1.154	0.9633	0.8457	0.4946
1975	4.535	4.444	4.179	3.321	2.248	0.7273
1976	3.358	3.291	3.136	2.676	2.016	1.277
1977	27.15	26.6	24.97	21.13	15.45	4.328
1978	14.42	14.14	13.04	10.92	9.599	4.348
1979	7.044	6.901	6.424	5.378	3.643	1.627
1980	3.937	3.86	3.553	2.969	2.608	1.513
1981	2.23	2.185	2.007	1.676	1.236	0.51
1982	4.567	4.475	4.203	3.723	2.745	0.9899
1983	2.616	2.565	2.363	1.976	1.737	0.8152
1984	1.632	1.6	1.496	1.216	0.8582	0.5072
1985	3.078	3.036	2.852	2.432	1.7	0.709
1986	18.49	18.12	16.66	13.89	10.16	2.975
1987	9.379	9.197	8.476	7.092	6.233	3.112
1988	2.617	2.566	2.365	1.979	1.739	0.736
1989	3.98	3.9	3.661	2.609	1.779	0.6242
1990	2.572	2.522	2.32	1.937	1.7	0.8614

#### Sorted results

Prob.	Peak	96 hr	21 Day	60 Day	90 Day	Yearly
0.037037037037037	27.15	26.6	24.97	21.13	15.45	4.348
0.0740740740740741	20.79	20.45	18.91	15.78	11.05	4.328
0.1111111111111111	18.49	18.12	16.66	13.89	10.16	3.415
0.148148148148148	14.42	14.14	13.04	10.92	9.599	3.112
0.185185185185185	11.08	10.87	10.01	8.37	7.356	3.085
0.2222222222222222	9.379	9.197	8.476	7.092	6.233	2.975
0.259259259259259	7.044	6.901	6.424	5.49	4.055	1.847
0.296296296296296	6.863	6.726	6.296	5.378	3.644	1.627
0.3333333333333333	5.962	5.843	5.683	5.003	3.643	1.518
0.37037037037037	5.642	5.529	5.085	4.388	3.278	1.513
0.407407407407407	4.567	4.475	4.203	3.723	2.745	1.425
0.4444444444444444	4.535	4.444	4.179	3.321	2.608	1.277
0.481481481481481	3.98	3.9	3.661	2.969	2.368	1.195
0.518518518518518	3.937	3.86	3.553	2.696	2.248	0.9899
0.5555555555555556	3.569	3.499	3.224	2.676	2.062	0.8695
0.592592592592593	3.358	3.291	3.136	2.609	2.016	0.8614
0.62962962962963	3.101	3.041	2.852	2.432	1.779	0.8152
0.6666666666666667	3.078	3.036	2.802	2.345	1.739	0.736
0.703703703703704	2.617	2.566	2.365	1.979	1.737	0.7273
0.740740740740741	2.616	2.565	2.363	1.976	1.7	0.709
0.7777777777777778	2.572	2.522	2.32	1.937	1.7	0.6242
0.814814814814815	2.23	2.185	2.007	1.686	1.236	0.51
0.851851851851852	2.01	1.97	1.831	1.676	1.151	0.5072
0.888888888888889	1.632	1.6	1.496	1.216	0.8582	0.4946
0.925925925925926	1.28	1.255	1.154	0.9633	0.8457	0.3509
0.962962962962963	0.3512	0.3438	0.3148	0.2608	0.2282	0.08412
0.1	19.18	18.819	17.335	14.457	10.427	3.6889

Average of yearly averages: 1.53632

Inputs generated by pe4.pl - 8-August-2003

Data used for this run:

Output File: triazoleNCapples250new

Metfile: w03812.dvf

PRZM scenario: NCappleC.txt

EXAMS environment file: ir298.exv

Chemical Name: triazole

Description	Variable Name	Value	Units	Comments
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Molecular weight mwt 69.07 g/mol

Henry's Law Const. henry 1.97e-10 atm-m<sup>3</sup>/mol

Vapor Pressure vapr 1.65e-3 torr

Solubility sol 7.0e+6 mg/L

Kd Kd 0.72 mg/L

Koc Koc mg/L

Photolysis half-life kdp 0 days Half-life

Aerobic Aquatic Metabolism kbacw 500 days Half-life

Anaerobic Aquatic Metabolism kbacs 504 days Half-life

Aerobic Soil Metabolism asm 250 days Half-life

Hydrolysis: pH 7 161 days Half-life

Method: CAM 2 integer See PRZM manual

Incorporation Depth: DEPI 0.1 cm

Application Rate: TAPP 0.082 kg/ha

Application Efficiency: APPEFF 1.0 fraction

Spray Drift DRFT 0.0 fraction of application rate applied to pond

Application Date Date 01-05 dd/mm or dd/mmm or dd-mm or dd-mmm

Interval 1 interval 7 days Set to 0 or delete line for single app.

Record 17:FILTRA

IPSCND 1

UPTKF

Record 18:PLVKRT

PLDKRT

FEXTRC

Flag for Index Res. Run IR

Flag for runoff calc. RUNOFF total

IR

none, monthly or total(average of entire run)

## **Appendix III**

### **SCI-GROW OUTPUT FILES**

**Output File from Sci-Grow Simulating Triazole Fungicide Application on Turf at  
1.3 lb ai/acre applied six times a year ( $T_{1/2}$  (soil aerobic metabolism input) = 101  
days).**

SCIGROW  
VERSION 2.3  
ENVIRONMENTAL FATE AND EFFECTS DIVISION  
OFFICE OF PESTICIDE PROGRAMS  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
SCREENING MODEL  
FOR AQUATIC PESTICIDE EXPOSURE

SciGrow version 2.3  
chemical:TRIAZOLE  
time is 10/11/2005 23: 8:24

Application rate (lb/acre)	Number of applications	Total Use (lb/acre/yr)	Koc (ml/g)	Soil Aerobic metabolism (days)
0.095	6.0	0.570	1.04E+02	101.0

groundwater screening cond (ppb) = 7.73E-01

**Output File from Sci-Grow Simulating Triazole Fungicide Application on Turf at  
1.3 lb ai/acre applied six times a year ( $T_{1/2}$  (soil aerobic metabolism input) = 36  
days).**

SCIGROW  
VERSION 2.3  
ENVIRONMENTAL FATE AND EFFECTS DIVISION  
OFFICE OF PESTICIDE PROGRAMS  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
SCREENING MODEL  
FOR AQUATIC PESTICIDE EXPOSURE

SciGrow version 2.3  
chemical:TRIAZOLE  
time is 10/11/2005 23: 9:37

Application rate (lb/acre)	Number of applications	Total Use (lb/acre/yr)	Koc (ml/g)	Soil Aerobic metabolism (days)
0.095	6.0	0.570	1.04E+02	36.0

groundwater screening cond (ppb) = 2.00E-01

**Output File from Sci-Grow Simulating Triazole Fungicide Application on Apples at  
1.0 lb ai/acre applied two times a year ( $T_{1/2}$  (soil aerobic metabolism input) = 101  
days).**

SCI GROW  
VERSION 2.3  
ENVIRONMENTAL FATE AND EFFECTS DIVISION  
OFFICE OF PESTICIDE PROGRAMS  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
SCREENING MODEL  
FOR AQUATIC PESTICIDE EXPOSURE

SciGrow version 2.3  
chemical:TRIAZOLE  
time is 10/11/2005 23:10:37

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Application rate (lb/acre)	Number of applications	Total Use (lb/acre/yr)	Koc (ml/g)	Soil Aerobic metabolism (days)
0.073	2.0	0.146	1.04E+02	101.0

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groundwater screening cond (ppb) = 1.98E-01

**Output File from Sci-Grow Simulating Triazole Fungicide Application on Apples at  
1.0 lb ai/acre applied two times a year ( $T_{1/2}$  (soil aerobic metabolism input) = 36  
days).**

SCI GROW  
VERSION 2.3  
ENVIRONMENTAL FATE AND EFFECTS DIVISION  
OFFICE OF PESTICIDE PROGRAMS  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
SCREENING MODEL  
FOR AQUATIC PESTICIDE EXPOSURE

SciGrow version 2.3  
chemical:TRIAZOLE  
time is 10/11/2005 23:12:54

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Application rate (lb/acre)	Number of applications	Total Use (lb/acre/yr)	Koc (ml/g)	Soil Aerobic metabolism (days)
0.073	2.0	0.146	1.04E+02	36.0

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groundwater screening cond (ppb) = 5.11E-02